Joint Review Panel Report

GSX Canada Pipeline Project

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GSX Canada
Pipeline Project

July 2003

Cover Photo:
Satellite Channel and Saltspring Island
by Gord Daw

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Summary

The GSX Canada Pipeline Project (the Project) is the Canadian portion of the Georgia Strait Crossing Project that involves the construction and operation of a natural gas pipeline from Sumas, Washington to a point on Vancouver Island, British Columbia (BC). The Project would be approximately 60 kilometres (km) long, of which approximately 44 km would be offshore and 16 km would be onshore.

The Joint Review Panel (the Panel) was appointed to conduct a review of the environmental effects of the Project under the *Canadian Environmental Assessment Act* (CEA Act) and to consider an application under the *National Energy Board Act* (NEB Act) for a Certificate of Public Convenience and Necessity for the Project. This Report sets out the rationale, conclusions and recommendations of the Panel in relation to its review of the Project under the CEA Act and includes a discussion of recommended mitigation measures and follow-up programs. The Report also provides a summary of comments received from the public. If the Project proceeds to regulatory consideration, it will be considered under the NEB Act and a report entitled Reasons for Decision will be issued under that Act.

The Panel considered the evidence of Georgia Strait Crossing Pipeline Limited (GSX PL) and Intervenors and public comments received during its review of the Project. The Panel concludes that, provided all commitments made by GSX PL in its application and undertakings during the GH-4-2001 proceeding, as well as the Panel's recommendations, are implemented, the Project is not likely to result in significant adverse environmental effects. Therefore, the Panel recommends that the Project be allowed to proceed to regulatory and departmental decision making as long as the recommendations in this Report are made part of the requirements of any approval by the National Energy Board (the Board or NEB).

The Panel was asked to include in its review of the Project the environmental effects of emissions resulting from the combustion of the gas to be transported by the Project, including the burning of the gas at the existing Campbell River cogeneration facility (ICP) and the proposed new generation facility called the

Vancouver Island Generation Project (VIGP), now proposed to be located at Duke Point near Nanaimo, BC. The Panel found that the generation facilities were not included in the scope of the Project to be assessed under the CEA Act and therefore it would not consider the environmental effects of combustion of the gas at ICP and VIGP in this Report. The Panel determined that it would include a consideration of the environmental effects of the combustion of the gas at the proposed VIGP in any consideration of the Project under the NEB Act.

Purpose, Need and Alternatives to the Project

While the purpose of the Project as scoped by the Minister of the Environment is to transport gas to Vancouver Island, the need for gas on Vancouver Island is largely a function of the anticipated need for electricity on Vancouver Island.

Alternatives to the Project that were presented fall into two categories: pipeline alternatives, and alternative forms of natural gas delivery. Information was also provided on the refurbishment or replacement of the existing electrical subsea cable system as an alternative to meeting the anticipated demand for electricity on Vancouver Island. While the cables might be an alternative way to meet the demand for electricity on Vancouver Island, the Panel has determined that they are not an alternative to the Project as scoped under the CEA Act.

The Panel considered the alternatives to the Project and concludes that sufficient information about the alternatives and GSX PL's analysis of those alternatives has been provided and that the information supports the selection of the Project.

Alternative Means

The Panel considered alternative means of carrying out the Project and is of the view that adequate information has been provided for the Panel to consider their technical and economic feasibility and their environmental effects. The Panel concludes that the general route is acceptable, as are the preferred construction methods.

Baseline Information

Concerns were expressed with the adequacy of baseline information and data used to select the Valued Ecosystem Components (VECs) and to predict environmental effects of the Project. The Panel concludes that the VECs chosen by GSX PL are appropriate for assessing the impact of Project activities and the sensitivity of the environment to these disturbances. The Panel concludes that the baseline information is satisfactory for the identification of potential effects, the likelihood of these effects occurring, and the sensitivity of the environment to these disturbances. The Panel has sufficient information to make a determination on the likelihood of significant adverse environmental effects arising from the Project. In some instances, where the ultimate success of mitigation measures may not be certain, the Panel has recommended that GSX PL be required to undertake follow-up programs to evaluate their effectiveness and report the results to the NEB.

Marine Environment

Manley Creek Landfall and the Nearshore Marine Environment

The Panel considered potential marine environmental effects on vegetation and fauna species at Manley Creek and Cape Keppel. The Panel notes that the pipeline route and horizontal directional drill (HDD) exit location were chosen to minimize effects to nearshore habitats, particularly eelgrass beds. GSX PL indicated that the HDD has a 90 per cent likelihood of being successful. However, if the HDD fails, GSX PL has prepared a contingency plan. The Panel has specific recommendations to ensure that detailed site-specific mitigation plans are developed for the contingency plan.

At Cape Keppel, short-term effects from construction would occur to benthic habitats as a result of the pipeline being placed on the slope of Cape Keppel. In the longer term, the Panel notes some species (i.e., those that prefer hard-bottom habitats) may experience beneficial effects due to the presence of the pipeline, while soft-bottom species would be displaced.

Marine Offshore Environment

Concerns were expressed that the pipeline may result in direct mortality of benthic (bottom-dwelling) species and interfere with the movement and behaviour patterns of benthic organisms such as Dungeness crab, California sea cucumber and the green sea urchin, and thus create a "barrier effect". Installation of the pipeline would create new hard-bottom substrate on the seabed creating an artificial "reef effect", which would attract a variety of invertebrate and vertebrate species. Potential negative effects relate mainly to changes in predator/prey relationships. Remobilization of contaminants contained in the sediments was also identified as a concern.

The Panel concludes that physical effects from the pipeline on deepwater benthic species would be limited in most areas to a narrow strip and that recovery times would vary, but long-term effects would be minimal. Uncertainties remain concerning the potential for contaminant remobilization during the jetting process. Therefore, the Panel recommends, if jetting is used, that GSX PL undertake a pre-construction sediment sampling program to determine if potential contaminants are present along the route and, if contaminants are identified, that GSX PL develop an appropriate mitigation plan. Significant adverse environmental effects on the community of seabed organisms from reef effects are not likely, though an effect (positive or negative) is expected. The Panel recommends that a follow-up program be required to verify the accuracy of the environmental assessment predictions and to assess the effectiveness of the mitigation developed for reducing barrier effects to benthic fauna.

Concerns were also expressed about the potential for acoustic disturbance from pipeline construction and operation activities to significantly impair the echolocation range of whale and porpoise species and, therefore, their ability to feed, to reproduce and to restore their populations to historic levels.

The Panel is mindful of the need to ensure that the Project does not add cumulatively to the environmental challenges faced by these populations. Therefore, the Panel has made recommendations related to construction timing windows and vessel operation protocols. Furthermore, the Panel recommends that appropriate post-construction assessment of acoustic impacts from pipeline operation on marine mammals be conducted and that, if necessary, additional mitigation measures be developed.

Concerns with respect to existing and proposed marine protected areas located within the general Project area focused primarily on potential effects on Ecological Reserve 67 (ER 67) and potential conflicts with the proposed National Marine Conservation Area (NMCA) in the Georgia Strait Marine Region. The Panel notes that the application before it does not include the option of routing through ER 67. The Panel concludes that, with the implementation of proposed mitigation measures, the environmental effects of routing north of ER 67 are not likely to be significant. Parks Canada recommended that the Panel require that all reasonable measures be taken by GSX PL to ensure maximum public safety in the vicinity of the proposed NMCA. The Panel notes that Parks Canada indicated that the pipeline was not incompatible with the zoning that would most likely be introduced for the proposed NMCA.

The Panel considered public safety within its review of the engineering design, the effects of the environment on the Project and accidents and malfunctions.

Terrestrial Environment

Ground and Surface Water

Concerns were expressed regarding the potential for alteration of surface water and groundwater quality and quantity. The Panel accepts the mitigation measures proposed by GSX PL but recommends that GSX PL have in place, prior to construction, a monitoring plan that allows for testing of groundwater; that nearby wells be monitored; and that GSX PL undertake permeability testing of the trench backfill.

Air Quality and Greenhouse Gases

The Panel examined the potential environmental effects of emissions from the Project on air quality and concludes that any air quality effects resulting from the Project would be minimal. Emissions from the Project would be outside the respective airsheds where VIGP and ICP would be located.

With respect to greenhouse gases (GHG), the Panel concludes that, although GHG emissions from the Project are very minor in comparison to overall emissions on Vancouver Island, they will contribute to climate change by combining and interacting with emissions from other present and future sources from around the world. However, the Panel relies on Environment Canada's statement that because emissions resulting from new natural gas pipeline and energy generation projects have been factored into the Government of Canada's outlook, the Project should not compromise Canada's ability to reach its Kyoto target.

Vegetation and Wildlife

Clearing of vegetation and topsoil stripping of the right-of-way (ROW) would result in some loss, alteration, and fragmentation of natural vegetation and of rare and sensitive plant communities. The Panel accepts GSX PL's mitigation measures and recommends that, to further ensure no adverse effects to rare plants, a pre-construction survey along the ROW be undertaken. The Panel also recommends a follow-up program.

The Panel concludes that GSX PL has, through routing and other mitigation measures, avoided and minimized potential adverse effects to wildlife. However, the Panel recommends a breeding bird nesting survey be carried out prior to construction and where active nests are observed GSX PL be required to file a detailed mitigation plan.

With respect to concerns related to great blue heron, the Panel notes that effects during construction are likely to be temporary, and not significant, due to the distance between the colony and the proposed ROW.

Effects on Socio-Economic Conditions

The construction and operation of the Project would have possible short- and long-term effects on fishing, harvesting, and aquaculture activities. GSX PL has proposed mitigation during construction and operation to address concerns raised by harvesters and fishers. These include: notification of construction activities; scheduling of activities to avoid sensitive periods; monitoring and follow-up activities; and compensation should Project-related loss be demonstrated.

Effects on Physical and Cultural Heritage

The Heritage Resource Impact Assessment for the previously unsurveyed portions of the terrestrial route has not yet been completed. Therefore, the Panel recommends that GSX PL file with the NEB for approval the results of that survey and proposed mitigation measures, including any comments from the provincial authority. The final Underwater Archaeological Assessment was filed late in the process and had not been provided to the provincial authority responsible for archaeology for comment. Therefore, the Panel recommends that prior to construction GSX PL file with the NEB for approval any comments and recommendations on the underwater assessment from the British

Columbia Ministry of Sustainable Resource Management, Archaeology Branch and a statement on whether GSX PL intends to implement the recommendations.

Effects on Traditional Use

In its application, GSX PL provided a summary of the current use of lands and resources for traditional purposes by First Nations in the area of the pipeline route. Additionally, traditional use studies for the Sencot'en Alliance, Cowichan Tribes and Tseycum First Nation were filed confidentially with the Panel.

This information indicated that both the terrestrial and marine portions of the route are currently used for traditional purposes, and that harvesting of marine resources, hunting and possibly plant harvesting are carried out.

GSX PL reached an agreement on the concerns First Nations had previously expressed regarding their interests. The Panel concludes that it is unlikely there will be significant adverse effects to the resources used for traditional purposes, and it is also unlikely that the Project would cause significant adverse effects to the current use of lands and resources for traditional purposes by aboriginal persons.

Cumulative Environmental Effects

The Panel concludes that, although GSX PL's approach to examining the issue of cumulative effects was not supported in all cases by quantitative baseline information, the approach was adequate. Given the nature of the Project, GSX PL's proposed mitigation measures, the recommendations of the Panel, and the limited extent of any residual effects, significant adverse cumulative effects of the Project are unlikely.

Accidents and Malfunctions

Accidents and malfunctions were identified by GSX PL and considered by the Panel. The Panel is of the view that the likelihood of an accident or malfunction of the Project would be low and effects would be mitigated to the extent practical given GSX PL's policies, practices and procedures and its commitment to implement them. The Panel concludes that significant adverse environmental effects due to accidents and malfunctions are unlikely.

Effects of the Environment on the Project

The Panel is of the view that GSX PL has adequately considered the potential effects of the environment on the Project in the design of the pipeline and in developing policies, practices and procedures to account for the effects of the environment on the Project and by committing to implement them. On the basis of GSX PL's commitments and the Panel's recommendations, the Panel concludes that there are not likely to be significant adverse effects of the environment on the Project.

Need for and Requirements of Follow-up

The Panel considered the need for and requirements of follow-up in the environmental assessment. Specific areas of follow-up identified by the Panel include: benthic flora and fauna along Cape Keppel near ER 67; barrier effects to benthic fauna; reef effects; and rare plant species.

Figure 1
GSX Canada Pipeline Project Site Map

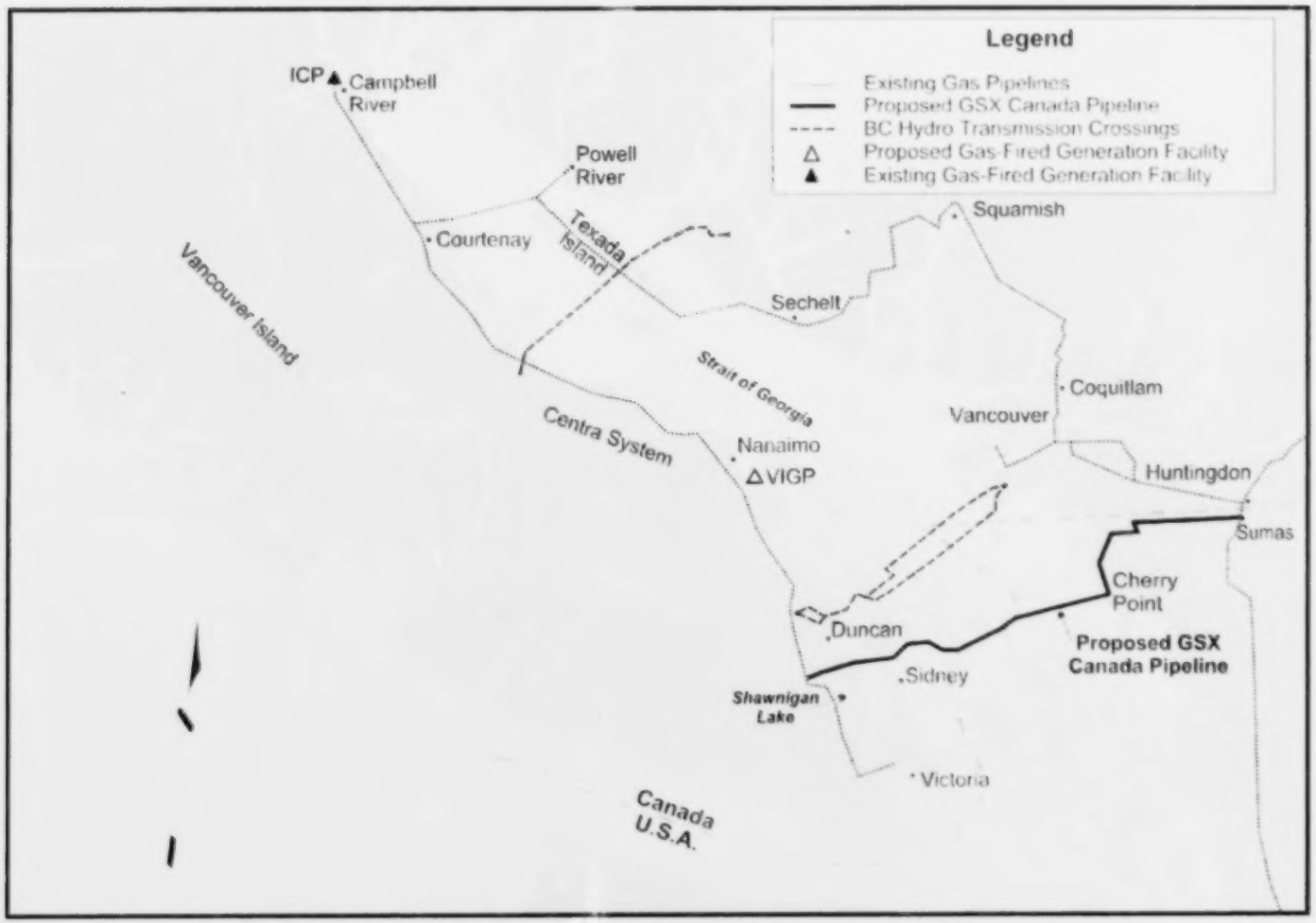
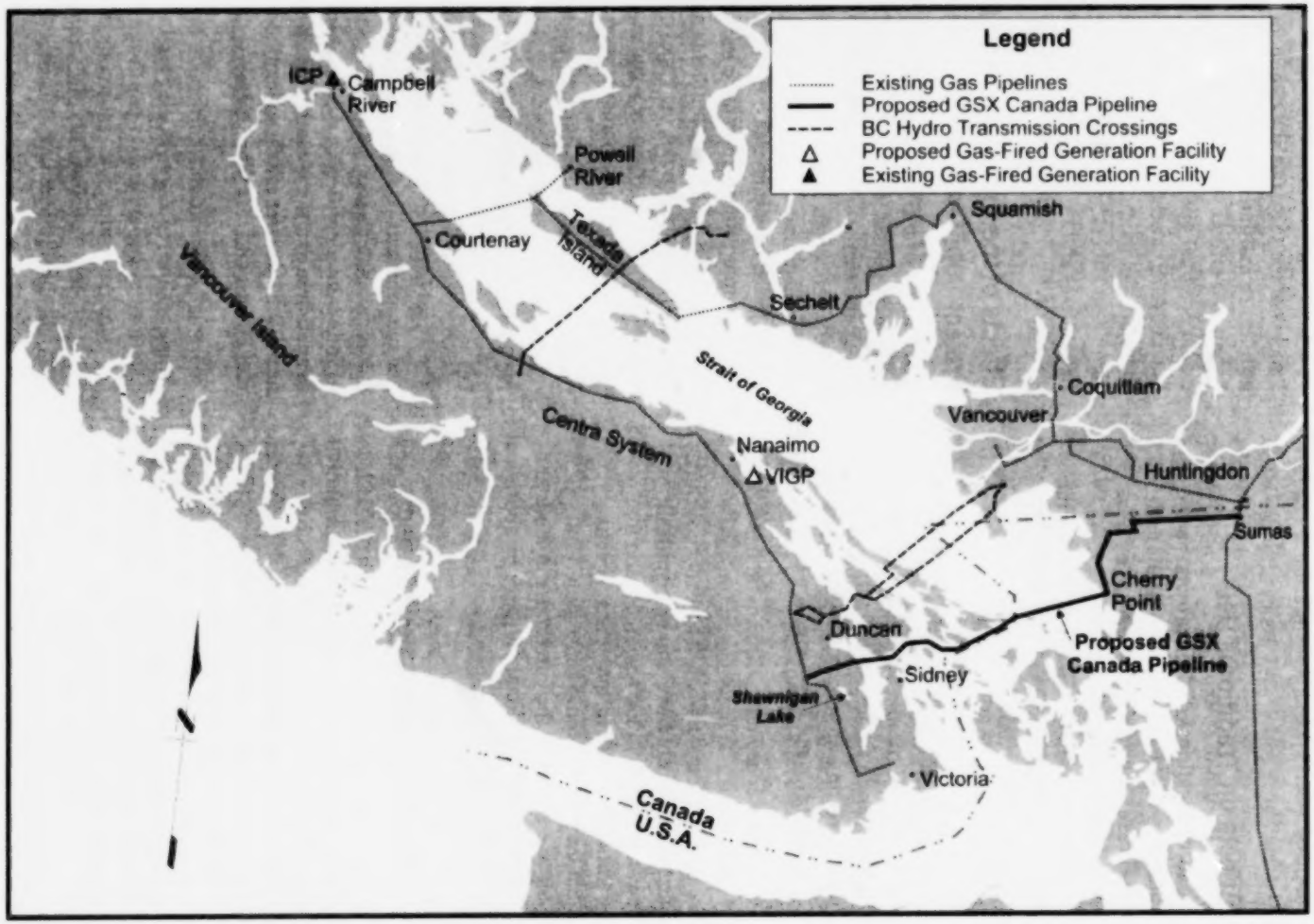


Figure 1
GSX Canada Pipeline Project Site Map



Introduction

1.1 Project Overview and Site Map

The GSX Canada Pipeline Project (the Project) is the Canadian portion of the Georgia Strait Crossing Project that involves the design, construction, and operation of a natural gas pipeline from Sumas, Washington to a point on Vancouver Island, British Columbia (BC). The Project consists of approximately 60 km (approximately 44 km offshore and 16 km onshore) of 406 milimetre (mm) outside diameter natural gas pipeline originating at a point on the Canada-United States (US) border in Boundary Pass east of Saturna Island, BC, to an interconnection with the existing Centra Gas British Columbia Inc. (Centra) pipeline at a point west of Shawnigan Lake on Vancouver Island, BC (see Figure 1). The facilities located in the US were the subject of a separate application that received approval from the US Federal Energy Regulatory Commission on 20 September 2002.

The marine portion of the Project route starts east of Saturna Island and winds in a southwesterly direction through Boundary Pass and south of North Pender and South Pender Islands. Maximum water depths of 320 metres (m) occur near the Pender Islands. The route then passes through Swanson Channel and north of Portland Island, where the water depth is approximately 55 m. From here the route passes through Satellite Channel between the provincial Ecological Reserve 67 (ER 67) and Cape Keppel on Saltspring Island. Moving west, the route passes north of Patey Rock with water depths of 70 m and angles southwest to the southern tip of Boatswain Bank. The landfall on Vancouver Island is located at the south end of Boatswain Bank near Manley Creek Park and the Chevron Hatch Point Terminal. At the landfall, a short, steep wooded bluff lies immediately above a flat cobble beach. From the landfall, the route heads in a westerly direction through rolling agricultural fields until it ascends the northern edge of Cobble Hill, where it encounters steep slopes (i.e., up to 45 per cent gradient) and heavily wooded terrain. Southwest of Cobble Hill, the route leaves the agricultural area near the abandoned Bamberton Quarry and winds in a southwesterly direction through wooded upland terrain past Shawnigan Lake to a

relatively level, wooded parcel of land, where it ends at the existing Centra West Shawnigan Meter Station near Renfrew Road, south of Duncan.

Included in the pipeline design are:

- mainline block valves located just landward of the Vancouver Island shoreline and at an intermediate point between the landfall and the Centra interconnection;
- a line block valve/blow off assembly, an excess flow control valve, a check valve, a separator, pig receiving equipment, liquid handling/storage equipment and Multiple Address System radio equipment (including a free standing tower approximately 44 m in height) located at the Centra interconnection;
- a Supervisory Control and Data Acquisition system linking the above facilities to control centres;
- permanent access roads, communications system and power supply as may be required to service mainline valve sites and other pipeline facilities; and
- various temporary construction workspace, equipment laydown areas, and access roads.

The terrestrial right-of-way (ROW) would consist of a 16 m permanent easement, with 7 m of additional temporary workspace and extra temporary workspace where required. The marine portion of the pipeline would consist of a 10 m wide ROW.

The Project (i.e., the Canadian pipeline excluding the US portion and any gas-fired electrical generation facilities) has an estimated capital cost of approximately $139.3 million CDN and is scheduled to be in service in October 2005.

1.2 Project Ownership

The Georgia Strait Crossing Project (Canada and US portions) is jointly sponsored by British Columbia Hydro and Power Authority (BC Hydro) and Williams Gas Pipeline Company (Williams). The Canadian portion would be constructed and operated by Georgia Strait Crossing Pipeline Limited (GSX PL) on behalf of GSX Canada Limited Partnership (GSX Canada LP). BC Hydro has a 98 per cent interest in GSX Canada LP and Williams has the other 2 per cent interest. The US portion would be constructed and operated by Georgia Strait Crossing Pipeline LP owned by Williams. The effect of the ownership structure is that the combined Canadian and US portions of the pipeline would be owned approximately 50 per cent by BC Hydro and approximately 50 per cent by Williams.

1.3 Panel History

Following the filing of a preliminary submission by GSX PL on 7 March 2000, the National Energy Board (NEB or the Board) solicited public comments on the environmental assessment and regulatory review process. On 4 October 2000, the Minister of the Environment, the Honourable David Anderson, pursuant to his authority under the *Canadian Environmental Assessment Act* (CEA Act), announced that the Project would be sent to an independent environmental assessment review panel.

GSX PL filed its application for a Certificate of Public Convenience and Necessity (Certificate) pursuant to section 52 of the *National Energy Board Act* (NEB Act) on 24 April 2001.

The Minister of the Environment referred the environmental assessment of the Project to a Joint Review Panel and a draft agreement between the NEB and the Minister of the Environment concerning the review of the Project was released for public discussion and comment in May 2001. The primary purpose of the agreement was to coordinate the environmental assessment required under the CEA Act and NEB Act by providing for a review of the environmental effects likely

to result from the Project and the appropriate mitigation measures. The agreement was finalized and released on 20 September 2001 (Appendix A). The members of the Joint Review Panel (the Panel) are Ms. Elizabeth Quarshie (Chair), Mr. Rowland Harrison, and the Honourable Bryan Williams, Q.C. Biographical information on each of the Panel members is provided in Appendix B.

The mandate of the Panel was to act as a joint review panel under the CEA Act to make recommendations to the Minister of the Environment and as a NEB panel under the NEB Act to consider all matters relevant to the application for a Certificate, under section 52. The Terms of Reference under the agreement outlined the scope of the review and listed the factors to be considered during the review under the CEA Act. The Agreement acknowledged that other factors may be considered under the NEB Act.

The Panel was charged with reviewing the environmental effects of the Project and the appropriate mitigation measures and setting out its rationale, conclusions and recommendations, including any mitigation measures and follow-up programs in the Joint Review Panel Report. This Report also provides a summary of comments received from the public. This Report will be submitted to the Minister of the Environment, who is responsible for forwarding it to all federal Responsible Authorities, for the preparation of the government response. Once this Report is submitted and the government response has received Cabinet consideration, the work of the Panel, under the CEA Act, is complete. However, the Panel's work under the NEB Act continues. The Panel must await the government response to the Report and take this into consideration before making any decision under the NEB Act.

1.4 Public Review Process

The mandate of the Panel, included conducting a review of the environmental effects of the Project, as set out in its Terms of Reference. To assist the Panel in its examination of the Project, public information and consultation sessions were held. Panel staff hosted information sessions on Vancouver Island and the Gulf Islands with First Nations and other public groups during the week of 22 October 2001. The purpose of these sessions was to provide information on how to participate in the public review process for the Project. An additional session was held on 23 February 2003, prior to the commencement of the oral public hearing to further explain participation in the hearing process.

On 9 November 2001, the Panel issued Hearing Order GH-4-2001 setting out the Directions on Procedure to be followed for the hearing of the application by the Panel (Appendix C). A List of Issues was released at that time for public comment. The List of Issues was subsequently finalized in the Panel's decision letter of 31 May 2002 (discussed below), following public consultation sessions held by the Panel in British Columbia in January 2002 (Appendix D). These sessions allowed interested organizations, groups and individuals to inform the Panel of the range of issues they thought the Panel should address during the review.

Some Intervenors asked the Panel to include in the List of Issues the environmental effects of the emissions resulting from the combustion of the gas to be transported by the Project, while other Intervenors focused on the environmental effects of the emissions that would result from the burning of the gas at the existing Campbell River cogeneration facility (ICP) and the proposed new generation facility called the Vancouver Island Generation Project (VIGP), now proposed to be located at Duke Point near Nanaimo, BC. These two facilities, GSX PL submitted, would receive the gas to be transported by the Project. As a result, the Panel decided to receive written argument and

hear oral argument on 9 and 10 April 2002 on whether it could and should consider these environmental effects.

In its ruling dated 31 May 2002 (Appendix D), the Panel determined that the generation facilities were not included in the scope of the Project to be assessed under the CEA Act and, therefore, it would not consider the environmental effects of the combustion of the gas at ICP and VIGP in this Report. The Panel determined that it would include the environmental effects of the combustion of gas at VIGP in the List of Issues for consideration pursuant to the NEB Act. Specific consideration of the environmental effects of the combustion of the gas at VIGP will be set out in any Reasons for Decision issued pursuant to the NEB Act.

During the public review process, the Panel obtained information from GSX PL through a combined written and oral process referred to as the GH-4-2001 proceeding. Prior to the oral hearing, the Panel and Intervenors asked written information requests of GSX PL. GSX PL submitted information that was supplemental to its original application. Intervenors also submitted written information to the Panel. In response to Intervenors' requests, the Panel organized a pre-hearing technical conference on marine issues which was conducted by Panel staff. The facilitator's report from that conference was submitted to the Panel. The Panel also received numerous letters of comment from the public during the GH-4-2001 proceeding.

The oral public hearing was held in Sidney, BC between 24 February 2003 and 19 March 2003. The hearing allowed Intervenors, including individuals, organizations and government representatives, to provide their views orally on the technical and environmental implications of the Project. GSX PL provided eight witness panels to be cross-examined by Intervenors and examined by the Panel. Intervenor witness panels were also cross-examined. A list of participants in the oral hearing is provided in Appendix E.

1.5 CEA Act Requirements

Under the CEA Act, the Panel acts in an advisory manner to the Minister of the Environment and must determine, taking mitigation measures into account, whether or not the Project is likely to result in significant adverse environmental effects. The scope of the Project was established for the Panel in the Terms of Reference (Appendix A). The Terms of Reference also listed the factors to be considered during the Panel's review. These are:

- the environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
- the significance of the effects referred to above;
- comments from the public that are received during the review;
- measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
- the purpose of the Project;
- alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means;
- the need for, and the requirements of, any follow-up program in respect of the Project;
- the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future;
- the need for the Project;
- the alternatives to the Project;
- the description of the present environment which may reasonably be expected to

be affected, directly or indirectly, by the Project, including adequate baseline characterization;

- the measures to enhance any beneficial environmental effects; and
- the proposal for Contingency and Emergency Response Plans.

The Panel was also required to consider the scope of the factors as identified in the Terms of Reference.

1.6 Participant Funding

The Canadian Environmental Assessment Agency (the Agency) under the Participant Funding Program provided funding to help interested individuals and organizations to participate in the Joint Panel Review of the Project. The funding committee, independent of the Panel and administered by the Agency, assessed applications and awarded a total of $100,000 to eight groups. The funds were intended to assist recipients in reviewing the application and in preparing for and participating in the GH-4-2001 proceeding.

2. Environmental Assessment Process

2.1 Scope of the Project

The Project as scoped by the Minister involves the construction, operation, decommissioning and abandonment of a natural gas pipeline from a point on the international border in Boundary Pass to a point on Vancouver Island, BC. The Project does not include any facilities or undertakings related to the end use of the gas to be transported by the Project.

2.2 Purpose, Need and Alternatives to the Project

The Panel's Terms of Reference require it to consider the purpose of the Project and the need for the Project. In its ruling of 20 January 2003 (Appendix D), the Panel discussed these factors and found that the "need for" and "purpose of" the Project relate to the alleged increasing demand for gas on Vancouver Island, most of which demand results from the generation of electricity at the existing ICP generation facility and the proposed VIGP generation facility. These facilities would generate electricity from the combustion of the gas to be transmitted by the Project and would, in turn, meet the anticipated demand or need for electricity on Vancouver Island. As a result, while the purpose of the Project as scoped is to transport gas to Vancouver Island, the need for gas on Vancouver Island is largely a function of the anticipated need for electricity on the Island.

The purpose of the Project and the need for the Project provide the context for the Panel's consideration of another required factor, the alternatives to the Project.

"The Operational Policy Statement defines the 'need for' the project as the 'problem or opportunity the project is intending to solve or satisfy'. It establishes the 'fundamental rationale for the project'. The 'purpose of' the project is defined as 'what is to be achieved by carrying out the project'. Both of these provide the context for the consideration of alternatives. 'Alternatives to' the project are defined as 'functionally different ways to meet the project need and achieve the project purpose'." ***Joint Review Panel Ruling, 20 January, 2003, p. 9.***

GSX PL provided information on a number of alternatives to the Project. These alternatives fall into two categories: pipeline alternatives, and alternative forms of natural gas delivery. In addition, information was provided on the refurbishment or replacement of the existing electrical subsea cable system as an alternative to meeting the anticipated demand for electricity on Vancouver Island.

The three pipeline alternatives described by GSX PL were:

- An expansion of the Centra system[1] without a new marine crossing.

  The existing Centra system would be expanded through looping and compression. This alternative was rejected by GSX PL because it would cost more than the entire Georgia Strait Crossing Project (i.e., including both the US and Canadian portions), and it would have limited further expansion potential for gas delivery on Vancouver Island.

- An expansion of the Centra system with a new marine crossing from Sechelt on the mainland to Harmac on Vancouver Island.

  The existing BC Gas and Centra systems would be expanded through looping and compression, and a new pipeline would be built between Sechelt and Harmac. This alternative was rejected by GSX PL because it would cost more than the entire Georgia Strait Crossing Project; it would have limited expansion potential due to the difficulty in looping through the Coquitlam watershed; the connection with Centra on Vancouver Island was further away from the large natural gas load in Victoria; and it would bypass potential markets in Washington State.

- A pipeline from Tilbury on the mainland and a marine crossing to Harmac on Vancouver Island.

  A new pipeline would be built from the BC Gas system at Tilbury to Roberts Bank, and then across the Strait of Georgia to Harmac. This alternative was rejected by GSX PL because it would have a slightly higher total cost than the entire Georgia Strait Crossing Project; it would cross the submarine foreslope of the Fraser Delta in a geologically unstable area; it would connect with Centra on Vancouver Island away from the large natural gas load in Victoria; and it would bypass potential markets in Washington State.

The two alternative forms of natural gas delivery to Vancouver Island described by GSX PL were:

- Transportation of liquefied natural gas.

  Marine transportation of liquefied natural gas would require onshore facilities on the mainland to compress, liquefy and store natural gas; marine vessels to transport liquefied natural gas to Vancouver Island; and onshore facilities on Vancouver Island to vaporise and store natural gas. GSX PL rejected this alternative because it would cost more than the entire Georgia Strait Crossing Project; it would raise substantial siting issues with respect to the required onshore facilities; and it would present hazards associated with marine transportation of liquefied natural gas.

- Transportation of compressed natural gas.

  Marine transportation of compressed natural gas would require onshore facilities on the mainland to compress and store natural gas; marine vessels to transport compressed natural gas to Vancouver Island; and onshore facilities on Vancouver Island to store compressed natural gas. GSX PL rejected this alternative because its costs would be greater than the entire Georgia Strait Crossing Project costs; it would raise substantial siting issues with respect to the required onshore facilities; and it would present hazards associated with marine transportation of compressed natural gas.

[1] Subsequent to the close of the oral hearing, Centra Gas British Columbia Inc. changed its name to Terasen Gas (Vancouver Island) Inc. On 23 June 2003 the Panel heard a motion filed by GSXCCC seeking to place on the record further evidence on this and the other Centra expansion alternative. The motion was dismissed and the ruling issued by the Panel in a letter dated 8 July 2003.

Information on the replacement or refurbishment of the existing subsea electrical cable system that presently transmits electricity from the mainland to Vancouver Island came from documents provided at public information sessions hosted by BC Hydro, and included in GSX PL's Application, and in answer to information requests and oral questions addressed to GSX PL. At the oral hearing, GSX PL's witnesses testified that in the mid 1990s BC Hydro's preferred option to meet the requirements of Vancouver Island for electricity was to use mainland generation and upgrade the existing subsea cable transmission system. However, the provincial government at that time directed BC Hydro to enter into negotiations for Power Purchase Agreements with private developers who were proposing to generate electricity on Vancouver Island using natural gas. BC Hydro did so and eventually decided that proceeding with the strategy of placing additional generation and a gas pipeline on Vancouver Island was the correct strategy.

In response to both written and oral questions, GSX PL provided its reasons for preferring the Project and the use of generation on Vancouver Island to the refurbishment or replacement of the existing subsea cable system. Although GSX PL's original position was that the replacement or refurbishment of the cable system was more expensive than the entire Georgia Strait Crossing Project, the evidence adduced during the hearing cast doubt on this conclusion. Intervenors submitted that the cable system would be less expensive than the entire Georgia Strait Crossing Project or, at most, of equal cost. One of GSX PL's witnesses, a BC Hydro employee conceded that the cost of the Project alone, less the sunk costs, was comparable to the cost of the refurbishment of the cable system. Some Intervenors took the view that the environmental effects of the refurbishment or replacement of the cable system would likely be substantially less than the environmental effects of the Project. They submitted that as the refurbishment or replacement of the cable system would utilize the existing right of way, there would not be the environmental effects associated with the establishment of a new right of way. Further information on the views of the public and further comments of the Panel on the cable system are included under Public Comments in section 15 of this Report.

> **". . . by BC Hydro's own evidence, the two competing portfolios result in equal costs to the ratepayer at the end of the day. They are equally costed alternatives to each other."** ***(SPEC/DSF, JRP Hearing Transcripts, 17 March 2003, Volume 15 (Day session), Para 23260)***

In final argument a number of Intervenors asked the Panel to consider the replacement or refurbishment of the existing subsea electrical cable as an "alternative to" the Project being assessed. This request stemmed from the Panel's ruling of 20 January 2003 in which the Panel stated that it would determine the relevance or weight of information put on the record in relation to the replacement or refurbishment of the existing subsea cable system after it heard argument at the oral hearing.

Some Intervenors stated that the Project was needed in order to provide firm electricity to Vancouver Island as a substitute for the existing electrical cable system.

> **"It's not a problem of gas, it's a problem of electricity."** ***(Mr. Skerik, JRP Hearing Transcripts, 18 March 2003, Volume 16, Para 24801)***

As a result, Intervenors submitted that the primary feasible alternative to the Project would be the refurbishment or replacement of the existing cable system. One intervenor described the Project combined with the proposed VIGP facility and the cable system

combined with associated mainland generation as portfolios that are functional alternatives to each other. A number of the Intervenors who argued that the refurbishment or replacement of the cable system was an alternative to the Project also submitted that information on the potential environmental effects of the refurbishment or replacement of the cable system was required to enable the Panel to complete its assessment responsibilities pursuant to the CEA Act.

The Panel has considered the arguments of the Parties. While the cables might be an alternative way to meet the demand for electricity on Vancouver Island, they are not an alternative to the Project as scoped under the CEA Act. "Alternatives to" the Project must achieve the Project purpose and meet the Project need. The Minister scoped the Project as a gas transportation undertaking that will move gas to Vancouver Island. The purpose of the Project is the transportation of gas. The need for the Project is to provide gas primarily for the generation of electricity on Vancouver Island. A project which supplies only electricity to Vancouver Island, such as the replacement or refurbishment of the existing subsea cable system, does not encompass the same purpose nor meet the same need as the Project. The subsea cable system would not transport gas and it would not meet the demand for gas to generate electricity on Vancouver Island and therefore is not, for the purposes of the CEA Act, an "alternative to" the Project as scoped by the Minister.

This Panel has considered the above-described alternatives to the Project. The Panel concludes that sufficient information about the alternatives to the Project and GSX PL's analysis of those alternatives has been provided for its consideration and the information supports the selection of the Project. Taking into consideration its ultimate determination that the Project is not likely to cause significant adverse environmental effects, the Panel need not undertake a more detailed assessment of the alternatives to the Project provided by GSX PL.[2]

2.3 Alternative Means

In discussing the environmental effects of alternative means of carrying out the Project, GSX PL examined the environmental effects associated specifically with alternative routes, alternative marine construction methods, and various options for installing the pipeline at the Manley Creek landfall.

Alternative Means

When discussing examples of alternative means, the Operational Policy Statement states that alternative means of carrying out the project could be defined as: the various ways that are technically and economically feasible, that the preferred alternative could be implemented or carried out. (CEAA OPS-EPO/2-1998)

2.3.1 Alternative Corridors and Routes

Information used by GSX PL in selecting its preferred corridor included Canadian Hydrographic Services nautical charts, air photos, numerous ground and air reconnaissance surveys, various environmental surveys, and discussions with government, non-government organizations, and local First Nations.

Potential corridors (see Figure 2) were identified between three control points, one on the international border in Boundary Pass west of the Strait of Georgia and Vancouver Island, and the remaining two points located at interconnection points with the Centra pipeline near Duncan on Vancouver Island. The two possible interconnection points were:

[2] Footnote of the Honourable Bryan Williams: "I would have welcomed the opportunity to consider the refurbishment or replacement of the subsea cables as an option or 'alternative' to the pipeline to meet the need for electricity on Vancouver Island as the cable system is something that should be considered. However, it appears that this Panel does not have the authority under the CEA Act in light of the scope of the Project set by the Minister to consider the cables as an alternative. It is for that reason alone that I have concluded that the Panel is precluded from considering the cable system as an alternative."

Figure 2
GSX Canada Pipeline Project
Potential Pipeline Corridors

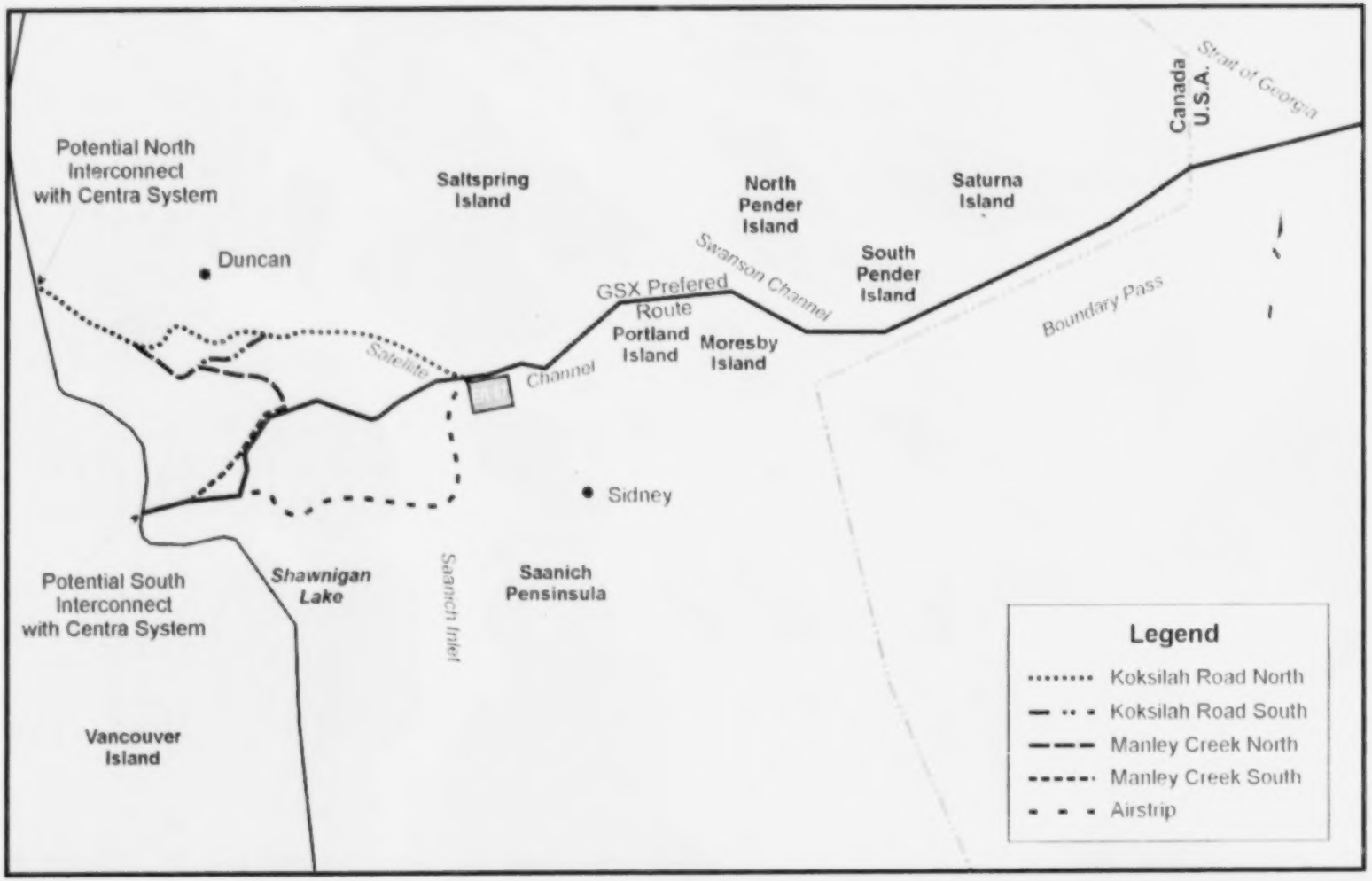
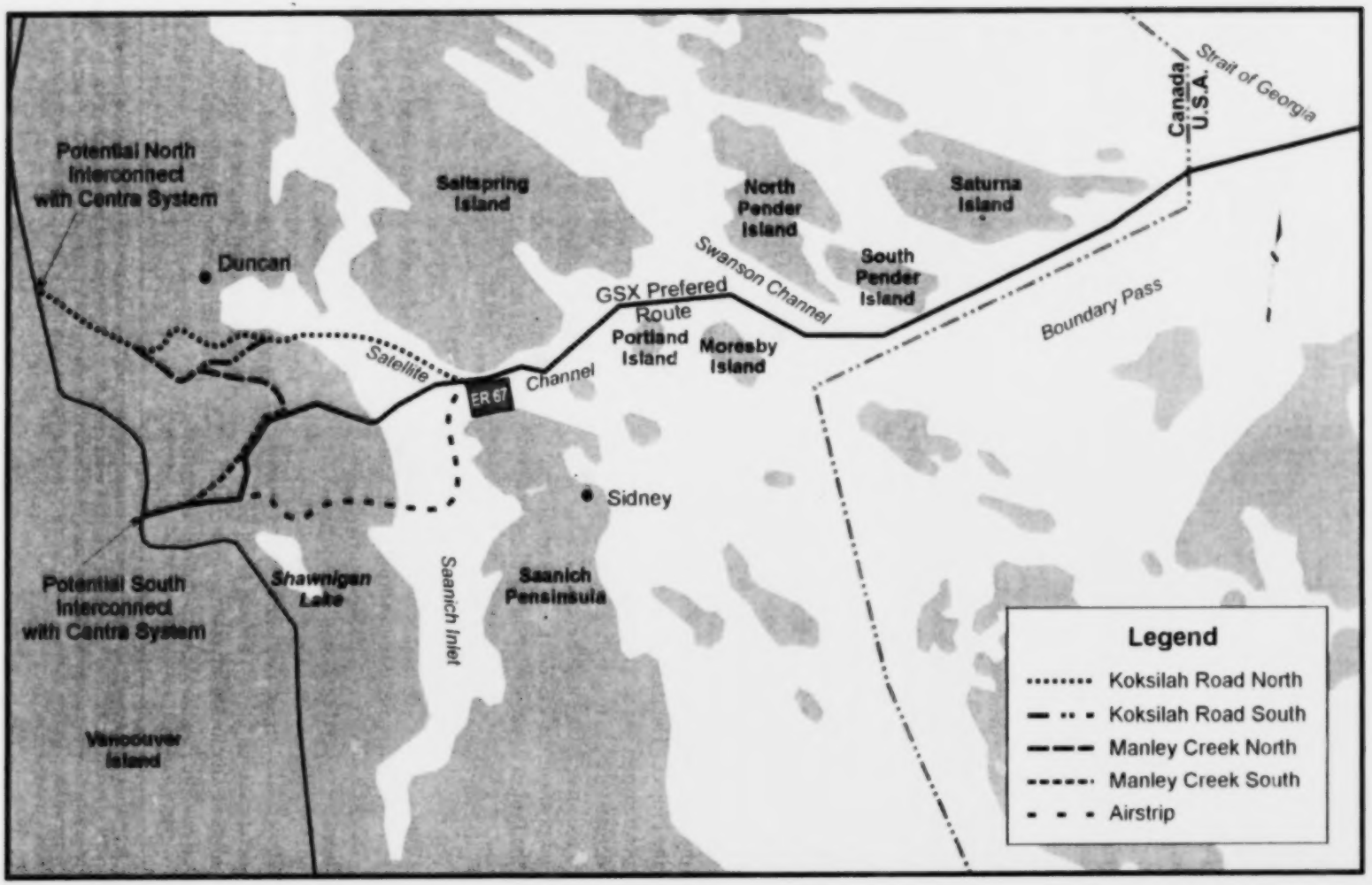


Figure 2
GSX Canada Pipeline Project
Potential Pipeline Corridors



- Northern Centra interconnection point – an agricultural field 1.5 km southeast of the Community of Deerholme, approximately 3.0 km southwest of Duncan; and
- Southern Centra interconnection point – beside the existing Centra meter station accessed by Renfrew Road west of the west arm of Shawnigan Lake.

In selecting these control points, GSX PL stated that it sought to avoid crossing the Cowichan River in the north, Shawnigan Lake in the south, and a heavily forested ridge, 300 m high, lying between the Koksilah River and Kelvin Creek. It also sought to minimize pipe length and find a suitable interconnect location on level terrain near all-weather road access. GSX PL stated that there were no other feasible interconnections with Centra in the area lying between Shawnigan Lake and Duncan.

A study area was delineated between the control points to identify all potential corridors. The marine study area encompassed a band varying in width from 2 km to 9 km through Boundary Pass, Prevost Passage, Shute Passage, Swanson Channel, Satellite Channel and Saanich Inlet. The terrestrial study area encompassed a 9 km wide band on Vancouver Island with potential landfalls between south of Cowichan Bay and Mill Bay. The terrestrial study area extended inland approximately 15 km to interseet with the existing Centra pipeline, which is generally oriented in a north-south direction parallel to the shoreline of Vancouver Island.

GSX PL established a number of environmental, engineering, and economic routing criteria to assist in the identification and evaluation of alternative corridors and routes.

The marine routing criteria were:

- location of the termination point of marine pipeline facilities in US waters, which was determined using similar marine routing criteria;
- minimize pipeline length where possible;
- avoid Ecological Reserve No. 67 (ER 67) in Satellite Channel;
- avoid unfavourable seabed conditions;
- avoid actively-used commercial ship anchorage areas; and
- avoid critical wildlife habitat and minimize routing through sensitive wildlife habitat.

The terrestrial routing criteria were:

- follow existing linear corridors;
- avoid areas of high population density, wherever possible;
- avoid environmentally sensitive areas associated with streams, rivers, and wetlands;
- minimize number of watercourse crossings;
- minimize effects on forested and park lands as well as residential and institutional land uses;
- avoid areas of known archaeological and cultural significance;
- minimize costs associated with the development and construction of the terrestrial pipeline segment and minimize costs associated with the operation of the entire pipeline segment;
- avoid geologic hazards such as active faults, and minimize areas prone to liquefaction; and
- address landowner/occupant, First Nation and general public concerns during public meetings or when contacted individually for permission to survey and study potential routes.

GSX PL used a sequential process of first identifying a corridor and then a route within the corridor. In this context, the marine corridor was a 600 m band, while a route was a 10 m to 50 m permanent easement centered on the pipeline. The terrestrial corridor was a 200 m wide band, and a route was the actual construction ROW consisting of 16 m of permanent easement, 7 to 10 m additional

temporary workspace and possibly extra temporary workspace where required.

GSX PL stated there were few alternative marine corridors due to technical constraints. Routing south of Moresby and Portland Islands was originally considered and discussed with local commercial fishers, who expressed concern about potential interference with commercial fishing activities. GSX PL determined that a suitable route could be found in the waters north of these islands without significantly adding to pipeline length. Routing through ER 67 was originally considered because the flat silty bottom is more favourable for marine pipeline construction than the submerged rocky slope of Saltspring Island to the north. GSX PL stated that new pipelines are not currently permitted within the boundaries of ecological reserves and, therefore, did not apply to the Panel for such a route.

Starting from a common point on the northeast side of ER 67, the marine corridor was divided into three new marine corridors to reach three potential landfall locations in Satellite Channel and Saanich Inlet (see Figure 2). The most northern landfall location identified in Satellite Channel was part way between Cherry Point and Cowichan Bay (Koksilah Road landfall). Two alternative terrestrial corridors (Koksilah Road North and Koksilah Road South) were identified between this landfall location and the northern Centra interconnection point. A central landfall was identified near Manley Creek at the south end of Boatswain Bank (Manley Creek landfall). Two alternative terrestrial corridors using this landfall were identified. The Manley Creek North Corridor tied into the northern Centra interconnection point, while the Manley Creek South Corridor tied into the southern Centra interconnection point. Finally, a southern landfall was identified in Saanich Inlet near Mill Bay (Airstrip landfall). A single terrestrial corridor, known as the Airstrip Corridor, tied-in the southern landfall with the southern Centra interconnection point. Routing of the marine pipeline to accommodate the Manley Creek and Airport corridors was controlled by Patey Rock, a submerged outcrop supporting a highly diverse biological community situated near the junction of Satellite Channel and Saanich Inlet.

The proposed Koksilah Road landfall was dismissed by GSX PL after learning from Transport Canada that it would not be possible to decommission the northern anchorages of the eight existing deep-sea freighter anchorages in the northern arm of Satellite Channel within the Chemainus Harbour Limit. These anchorages would have impacted the proposed marine pipeline in the area of the proposed Koksilah Road landfall. The pipeline would have to be buried at a depth greater than 3 m to protect it from physical damage, which would require more seafloor excavation. This would have greater impact on the environment and marine ecosystem. Project engineers identified no feasible options for circumnavigating these anchorages. In addition, geotechnical conditions on the nearshore slope at the landfall would make for a very challenging pipeline installation.

The remaining three alternative terrestrial corridors - Manley Creek North, Manley Creek South, and Airstrip - were evaluated by GSX PL according to the pipeline routing criteria described previously. Manley Creek South had the fewest adverse effects and was also the most technically feasible overall. It was therefore identified by GSX PL as the preferred corridor.

"The pipeline routing criteria did not include any provision for including groundwater protection considerations." *(Braithwaite Estates, JRP Hearing Transcript, 17 March 2003, Volume 15 (Day session), Para 23449).*

Intervenors including Braithwaite Estates, Arbutus Ridge, Gordon L. Bell, Shadybrook Farm, the Marine Coalition and the Saturna

Community Club expressed concerns with the routing criteria. These included possible contamination and drawdown on groundwater, and effects on wildlife and habitat such as for great blue heron. The Marine Coalition was particularly concerned about possible effects on the proposed NMCA in the southern Strait of Georgia, for which the enabling legislation was introduced by the Government of Canada in 1995. Intervenors stated that GSX PL did not apply rigour to the comparative analysis used to select the preferred corridor, did not explain the weight attributed to each criterion and, as a result, did not adequately explain why the proposed route was chosen. The Marine Coalition stated that the final selection of criteria by GSX PL was unilateral, arbitrary, often qualitative and based only on professional judgement.

2.3.1.1 Preferred Route

Once the Manley Creek South corridor was selected, the proposed route was reviewed and surveyed, and studies were undertaken along the route and used to refine the corridor from a width of 200 m to the standard construction ROW width of 23 m. Detailed field surveys, studies and discussions with landowners revealed certain areas where the most suitable route, or the route most acceptable to landowners, was outside the corridor. GSX PL adjusted the corridor accordingly.

The route selected made use of Agricultural Land Reserve (ALR) lands to the extent possible and existing cut blocks in areas of Forest Land Reserve (FLR) where possible. It was GSX PL's position that pipelines are a compatible use within ALR lands and that the designation provides protection from encroachment by future subdivision development and provides a buffer between the ROW and existing developments. GSX PL stated it would implement conditions established by the BC Land Reserve Commission to minimize effects to agricultural operations. During the review process, further route modifications were made to address concerns expressed by the Evergreen Independent School and the University of British Columbia and the Cedar Lodge Society (Skeleem Recovery Centre).

The Project does not require compressor facilities in Canada. The only long-term facilities required, apart from the pipeline itself, are an interconnect with Centra, block valves and minor pipeline appurtenances. Short access roads and distribution power lines to block valve sites would also be required. GSX PL plans to use Westcan Terminals Ltd.'s dock located at Cowichan Bay as a temporary facility site for prefabrication of the pipeline segments to be used for construction of the landfall horizontal directional drill (HDD). A temporary storage and handling site is currently planned for the Esquimalt and Nanaimo railway siding near Duncan. In addition, the workspace area near the western end of the ROW may also be used for pipe handling and storage.

Additional temporary facilities for construction may include staging areas, pipe yards, contractor yards, temporary access roads (shooflies), borrow pits and a pipe makeup area and a load out/fabrication terminal for marine pipeline installation support. GSX PL would use existing clearings or sites and temporary access roads whenever possible.

The Panel considered the methodologies used by GSX PL to identify and select its preferred corridor and the proposed general route. The Panel is of the opinion that the criteria used in selecting the preferred corridor and general route were appropriate. The planning process for selecting the corridor and the applied-for route generally took into account concerns identified by government, non-government organizations and local First Nations. Where specific concerns were raised by landowners, GSX PL responded to these concerns by further modifications to the proposed route.

2.3.2 *Alternative Marine Construction Methods*

GSX PL identified two specific areas where alternative methods of construction occur on the marine portion of the Project. These are the marine pipe lay operations and the landfall at Manley Creek.

2.3.2.1 *Marine Pipe Lay Operations*

The marine segment of the pipeline would be installed by laying pipe directly onto the surface of the seafloor (i.e., bottom lay method) and then trenching portions of it into the seabed. Trenching would be used in specific areas to minimize effects to bottom trawlers and to facilitate the movement of benthic (i.e., bottom-dwelling) organisms over the long term.

Trenching would be accomplished using either a subsea plough, jetting machines, or mechanical trenchers. GSX PL stated that the final selection of the trenching method would occur at the time of the selection of the marine contractor. The plough consists of either fixed or movable cutting blades that penetrate into the seabed and displace the soil directly to the sides of the excavation as the plough is towed along the route or along the pipeline by a surface support vessel. With jetting, a support surface vessel would pump water at high pressure down hoses to the jet sled, which is towed along the length of the marine portion of the pipeline. The jetting action would cut and displace or fluidize the soils in the immediate vicinity of the pipeline permitting the pipeline to settle more deeply into the seabed. The water jetting action suspends soil particles in the water column creating a large plume of suspended sediment as it passes along the tow route. A mechanical trencher uses a variety of mechanical cutting arms to extend underneath the pipeline and down into the seabed. It cuts the soil and then displaces it to the sides of the trench using an action similar to that of a chainsaw. A surface support and tow vessel powers the trencher. Some mechanical trenchers incorporate dredging technology in combination with the cutting arms to provide a more effective clearing action.

GSX PL submitted that effects resulting from the bottom lay method would be confined to immediate smothering of benthic and infaunal organisms located under the pipeline, and short-term effects from sediment resuspension and deposition in the immediate vicinity of the pipeline. Pipeline segments lying on the seabed may impede the movement of benthic organisms, such as Dungeness crab, resulting in a "barrier effect". Numerous free spans along the pipeline would partially mitigate this effect by allowing organisms to pass under the pipeline. Mesh wrapping of bottom lay pipe segments was proposed by GSX PL to reduce barrier effects by making it easier for organisms to cross over the pipeline.

A more detailed discussion of environmental effects associated with alternate trenching methods and the Panel's conclusion is provided in section 4.3 of this Report.

2.3.2.2 *Landfall at Manley Creek*

GSX PL stated that the preferred option for constructing the landfall at Manley Creek is the use of the HDD method, originating in an uplands area, approximately 230 m landward of the shoreline and exiting approximately 430 m seaward of the shoreline. The exit point would be in approximately 21 m of water. GSX PL stated there was a 90 per cent likelihood of the HDD being successful. In the event the HDD is unsuccessful, GSX PL proposed to then use either a partial HDD or full open cut method, which would require excavation through the foreshore area including shallow subtidal and intertidal zones. GSX PL has prepared a landfall open cut contingency plan. A more detailed discussion of environmental effects associated with alternate landfall construction methods and the Panel's conclusion are provided in section 4.2 of this Report.

The Panel has considered the alternate construction methods for the landfall at Manley Creek. The Panel is of the view that the information provided by GSX PL was sufficient and supports the preferred option and the contingency plan for the landfall.

Horizontal Directional Drilling

Horizontal directional drilling (HDD), also known as directional boring or directional drilling, is a method of installing underground pipes and conduits from the surface along a prescribed bore path. Installation of lengths up to 2000 m have been completed for pipes of similar diameter to that of the Project. The process is used for installing telecommunications, power cable conduits, water lines, sewer lines, gas pipelines, oil pipelines, product pipelines and casings used for environmental remediation. HDD is used when crossing waterways, roadways, congested areas, environmentally sensitive areas, and in situations where other methods are not feasible.

The HDD planned for the Project would be accomplished in three stages: (1) a pilot hole would be drilled along the designed drill path - boring is accomplished through the cutting action of a rotating drill bit while drilling mud is used to lubricate the bit, maintain the hole, and remove drill cuttings; (2) the pilot hole would be enlarged by reaming in multiple passes to allow the pipe to be pulled through; and (3) the natural gas pipeline segment would be pulled through the drilled and reamed hole. The HDD drilling fluid is a slurry of fresh water and bentonite, a naturally occurring colloidal clay, as well as trace amounts of a non toxic polymer that would enhance the characteristics of the drilling fluid. At the marine exit point a glory hole would be excavated to facilitate the transition from the HDD to the natural profile of the seafloor, and to contain drilling mud from the HDD process. Marine environmental issues associated with the HDD activities relate primarily to potential effects on intertidal and subtidal habitat (e.g., eelgrass beds) from suspended sediment and siltation resulting from excavation of the glory hole and losses of drilling mud.

Overall, the Panel concludes that GSX PL has provided adequate information on route selection and alternative marine construction methods that are technically and economically feasible for the Panel to consider these alternative means and their environmental effects. The Panel accepts the preferred means identified by GSX PL.

2.4 Environmental Effects and Cumulative Effects

GSX PL's Environmental and Socio-Economic Impact Assessment methodology considered potential environmental effects of the proposed construction, operation, decommissioning and abandonment of the Project as defined by the CEA Act. GSX PL considered it to be impractical to assess the Project with specific reference to every component of the ecosystem. Therefore, the assessment focused on a range of Valued Ecosystem Components (VECs) that could either have an important effect on the Project or were widely recognized as important for ecological, social or economic reasons. Potential environmental effects and VECs were identified through the public and government consultation processes, literature review, consultation with technical specialists, and review by the GSX PL assessment team. The VECs of greatest concern within the marine environment were identified as: water and substrate quality; eelgrass and kelp beds; benthic invertebrate species/communities; fish; seabirds and migratory birds; and marine mammals. Terrestrial VECs were: ground and surface water; freshwater fish and associated riparian habitats; land productivity; air quality; vegetation; wildlife; and ecologically sensitive areas.

Concerns were expressed by several Intervenors over the approach used by GSX PL for the selection of the marine VECs. It was argued that the consultation process should have been more comprehensive and inclusive, and that more systematic procedures, such as current environmental impact assessment analytical tools, should have been used for the final VEC selection. The selection of

appropriate VECs was seen as part of a larger issue concerning the overall methodology applied to the identification of environmental issues, the delineation of spatial and temporal boundaries for the environmental assessment, and the need for associated baseline and follow-up programs.

The Panel notes that VECs are elements of the natural and human world that are considered to have valuable attributes for economic, social, cultural, environmental or aesthetic reasons. The selection of appropriate VECs is a critical component of scoping in environmental assessment, to ensure that the assessment remains focused and the analysis remains practical. VECs are generally selected by distilling stakeholder concerns, assessing and prioritizing various components through a weighting scheme, and soliciting input from experts and stakeholders.

The Panel concludes that, while a more comprehensive and systematic effort could have been made by GSX PL in the selection of marine VECs, the chosen VECs are appropriate for assessing the impact of Project activities and the sensitivity of the marine environment to these disturbances. The chosen VECs provided an adequate basis for considering the effects of the Project on the marine environment.

Spatial and temporal boundaries used for the assessment by GSX PL included both local and regional study areas and several time frames. The spatial boundaries used to assess Project effects included one or more of the following study areas:

- the immediate 23 to 26 m wide pipeline ROW on land and 10 m wide marine ROW, including any additional temporary or permanent facility and land requirements for construction and operation;
- a local study area corridor defined by an approximate 1,000 m buffer on both sides of the proposed ROW and taking in an area of approximately 121.6 km^2; and
- a 1,145.84 km^2 regional study area defined by Terrain Resource Information Management map sheets.

Consideration was also given to broader areas (i.e., provincial, national and transboundary as detailed in the NEB draft Scoping Package) where the VEC in question is known to occupy a larger area within the Strait of Georgia ecosystem, Vancouver Island and Gulf Islands. Where populations are known to migrate over vast areas, the cumulative effects discussions were focused on local and regional population and habitat status, and did not include detailed consideration of effects and changes to habitat supply in countries or areas remote from the Project.

The temporal boundaries used for Geographic Information System based analysis used in this assessment usually included two past time frames (years c.1950 (compilation of 1949/1950 and 1951/1952 air photo data) and 1975) as well as the present (based on year 2000), to provide an historical perspective on patterns of land use and habitat supply. Other periods of assessment include the approximate twelve-month construction period and the operations phase assumed to be at least 40 years post-construction (year 2003 to 2043). Data were also obtained for long-term (250 yr+) change in forest age.

GSX PL developed mitigation for potential adverse environmental effects based on standard industry practice, or modifications to standard practices recommended by its technical specialists, and on input from the various consultation and information sessions. Mitigation measures were based on site-specific environmental studies, surveys and data gathered by technical specialists. The Environmental Protection and Reclamation Plans (EPRPs) developed by GSX PL contain details on environmental compliance, environmental protection and reclamation measures, environmental education, environmental inspection, issues resolution, and monitoring and follow-up. To accommodate exceptional situations (e.g., accidents and malfunctions), contingency

plans were developed. The assessment of cumulative effects, potentially arising as a result of Project interactions with other developments, human activities and biophysical factors, were an integral part of the environmental assessment.

To assess the significance and likelihood of adverse environmental effects, GSX PL used assessment criteria identified in the CEA Agency's Practitioners Guide. GSX PL's assessment centered on the key or most influential assessment criteria to determine the significance of the residual environmental effects (e.g., the ecological context of turbidity and sedimentation in an area of active bottom-trawling).

Issues arising from the construction, operation, decommissioning and abandonment of the proposed pipeline and its associated facilities are complex. In the Panel's view, the magnitude and importance of these issues depend on how well the Project is designed and constructed and the sensitivity of the environment to disturbance. To keep these issues in perspective, the Panel developed the following framework for reviewing the potential effects. First the Panel considered the effect of Project activities on marine and terrestrial components, the likelihood of these effects actually occurring, and the sensitivity of the environment to these disturbances. These were considered on a component by component basis. Next the Panel considered the cumulative effects likely to arise as a result of the effects of the Project acting cumulatively with the effects of other projects. Finally, the Panel considered the effects the environment could have on the Project.

2.4.1 Baseline Information

The Marine Coalition and other Intervenors raised a specific concern with respect to the adequacy of baseline information and data used to select the VECs and to predict environmental effects of the Project. This concern was expressed by the Marine Coalition as an over-arching issue that affected the Panel's ability to assess potential effects, the likelihood of these effects actually occurring, sensitivity of the environment to these disturbances, the adequacy of the proposed mitigation, and to determine the significance of environmental effects under the CEA Act. Various areas of the environmental assessment that were considered to be deficient with respect to the adequacy of baseline information were identified. Several Intervenors, including the Marine Coalition, urged the Panel to consider the Precautionary Principle in assessing the Project, especially where scientific uncertainty exists with respect to the identification and mitigation of effects to the environment.

As noted earlier, for the selection of VECs, GSX PL relied on professional experience, review of technical literature relevant to the area, consultation with local resource users, local consultants and government resource managers. In relation to the VECs it had identified, GSX PL provided a wide variety of baseline information ranging from general to specific information on local and regional biological species and communities. Baseline studies included literature searches, field studies to identify the presence or absence of seasonal flora and fauna, habitat mapping in the Project area, examination of the effects of existing subsea pipelines, and laboratory studies focused on the ability of crabs to cross a pipeline.

The Panel views baseline information as the foundation for evaluating environmental effects under the CEA Act. Baseline information allows for identification and characterization of the physical, biological and social conditions at the time a project is proposed. This provides the foundation for predicting project-related environmental effects. Using this approach, a project applicant is expected to identify the VECs that may be affected by the project and describe the effects of the project on those VECs. In this manner, the applicant would demonstrate whether or not there would be a likelihood of significant adverse environmental effects.

The Panel recognizes that there may be some uncertainties in environmental assessment, either in terms of describing the existing environment or predicting subsequent effects. An applicant cannot reasonably be expected to collect information on every aspect of the environment that has any potential to be affected by a project to address uncertainties. Rather, the assessment process should identify key VECs and provide a focus for the consideration of potential effects to these VECs. The Panel notes that the selection of appropriate VECs is a critical component of scoping in environmental assessment, which ensures that the assessment remains focused and the analysis remains practical.

GSX PL provided information on potential effects to VECs, mitigation measures, and monitoring programs to ensure that mitigation is effectively implemented and evaluated for success. The Panel recognizes that the baseline information used by GSX PL to predict Project effects relied heavily on professional judgment. The Panel notes, however, that baseline information relevant to the Project area was reasonably supplemented through the submission of supplemental evidence, responses to written Information Requests, the Marine Technical Conference, written evidence of Intervenors, and cross-examination of GSX PL's witnesses.

Throughout the review process, where there were uncertainties about potential effects, GSX PL provided an analysis of possible scenarios, proposed appropriate mitigation measures or altered the Project design. Specific examples include the use of an HDD at the Manley Creek landfall (see section 4.2.1); use of mesh wrap on portions of the marine pipeline to address concerns associated with the barrier effect (see section 4.3.1.3); permeability tests on backfilled trench material to address concerns with potential effects to groundwater (see section 5.1); and avoidance of old growth forests through route alterations (see section 5.5).

GSX PL also committed to gathering additional pre-construction baseline information that would add to the existing knowledge base. These studies generally consist of surveys that have yet to be completed due to minor re-routes and access restrictions on the terrestrial section of the pipeline. Also on the terrestrial portion, further soil surveys and geotechnical investigations have been proposed. Detailed geotechnical surveys would be conducted prior to construction to confirm assumptions and facilitate completion of final pipeline design details. For the marine portion, two pre-construction eelgrass surveys designed to address seasonal variations and one additional intertidal benthic infaunal survey are proposed for Boatswain Bank. Although not required to determine the likelihood of significant environmental effects for the Project, surveys that account for seasonal variation, such as the marine surveys, would provide additional information to assist in evaluating effects assessment prediction and the effectiveness of mitigation measures through post-construction monitoring.

Furthermore, GSX PL committed to, or the Panel has made recommendations that GSX PL undertake, several follow-up programs (see section 14.2). The purpose of these follow-up programs is to verify the accuracy of effects assessment predictions and to determine the effectiveness of mitigation measures. The Panel expects that the pre-construction surveys and the follow-up programs would be designed with scientific rigour, be quantitative in nature where possible and contain reporting and success measurement criteria, among other factors as described in section 14.2.

In carrying out its examination of the Project, the Panel considered its mandate, evidence from GSX PL, concerns and evidence of Intervenors, including federal departments and agencies, and its own professional expertise. The Panel approached the Project review in a precautionary manner such that protection of the environment and human health received careful consideration. The Panel considers that the review process under the CEA Act allows for the identification of scientific uncertainty

and adopts a precautionary approach to the management of that uncertainty. This would be consistent with the Precautionary Principle (i.e., the Panel has made recommendations in advance of federal authorities taking action in connection with the Project.).

The Panel concludes that the VECs chosen by GSX PL are appropriate for assessing the impact of Project activities and the sensitivity of the environment to these disturbances. The chosen VECs provided an adequate basis for considering the effects of the Project on the environment. Furthermore, the Panel concludes that the baseline information is satisfactory for the identification of potential effects, the likelihood of these effects occurring, and the sensitivity of the environment to these disturbances. The Panel has sufficient information to make a determination on the likelihood of significant adverse environmental effects arising from the Project. In some instances, where the ultimate success of mitigation measures may not be certain, the Panel has recommended that GSX PL be required to undertake follow-up programs to evaluate their effectiveness and report the results to the NEB.

The Panel notes that some of the pre-construction environmental surveys proposed by GSX PL that would add to the existing baseline information are not captured in any other Panel recommendations and, for this reason, the Panel makes a general recommendation that GSX PL file the results of its efforts to collect further pre-construction information, as committed to during the GH-4-2001 proceeding, with the NEB.

Recommendation 1

The Panel recommends that GSX PL complete all outstanding pre-construction surveys, not referenced in any other condition, for the terrestrial and marine portions of the pipeline as committed to during the GH-4-2001 proceeding and file the results with the Board for approval 60 days prior to the commencement of construction, including clearing or ground-breaking activities and marine pipe lay operations. The filing shall identify any potential adverse effects and any additional mitigative measures to be implemented.

The Panel notes that the *Species at Risk Act* (SARA) has received Royal Assent, certain provisions have come into force and the remaining provisions may come into force prior to construction of the Project. The Panel is of the view that the Canadian Wildlife Service should be consulted to ensure the Project is constructed in compliance with the provisions of SARA. Furthermore, the Panel notes that, if modifications to the Project design are necessary to comply with SARA, GSX PL would be required to apply to the NEB for approval.

3. Environmental Setting

3.1 Marine Environmental Setting

3.1.1 Marine Physical Environment

The marine portion of the proposed pipeline route is located within the Strait of Georgia. This ecoregion generally forms a broad, shallow coastal basin, known as the Georgia Depression. It is also known as the Salish Sea, a traditional name that honours the First Nations peoples who historically and presently inhabit the area.

Maximum water depths within the Project area of approximately 320 m occur near the Pender Islands. Water depths west of Moresby Island are typically less than 100 m, while east of Moresby Island into Boundary Pass, depths generally range from 150 m to approximately 300 m. The landfall site on Vancouver Island is located at the south end of Boatswain Bank, a broad shallow bank where the 30 m contour is located approximately 600 m offshore. Bottom topography within the Project area is predominantly flat with a soft substrate and little relief. However, some elevated, exposed bedrock features occur in the vicinity of Boundary Pass, south of Saturna, north of Moresby and Portland Islands, and at Patey Rock at the north end of Saanich Inlet. A field of large submarine sand dunes, some approaching eight metres in height, is located near the proposed route in Boundary Pass. The majority of seafloor sediments along the proposed pipeline route can be attributed to glacial deposition. Silt, sand and gravel are present at various locations along the route.

General water circulation patterns within the Strait of Georgia are driven by the large freshwater inflow from the Fraser River and by daily tidal flows at both the north (Johnstone Strait) and south (Strait of Juan de Fuca) ends. The replacement rate of seawater within the Strait of Georgia is approximately six to nine months. Tides in the Strait of Georgia are diurnal (twice per lunar day) with typical tidal ranges along the proposed route averaging about 2.5 m. Ocean currents within the Project area are largely driven by tidal action and are strongest within Boundary Pass where currents of over five knots occur. Wave heights along the Project route are generally less than 1 m, although there is seasonal variability with

waves as high as 4 to 5 m being reported during winter storms in the Boundary Pass area.

Water quality within the Project area is influenced by a number of factors, including tidal exchange and local topography, freshwater inputs primarily from the Fraser River, and discharges from human sources. Water temperatures range from about 5 to 20°C at the surface and 7 to 10°C near the bottom, with a salinity range of 24 to 32 parts per thousand (ppt) (typical open ocean salinity is 34 to 35 ppt). Waters of the Strait of Georgia are generally high in nutrients due to contributions from outside marine sources and to a lesser extent from coastal rivers. This nutrient-rich environment supports a highly productive and diverse ecosystem. Pollution sources in the immediate Project area include agricultural and urban runoff, municipal and vessel discharges, as well as possible contaminants from a pulp mill at Crofton located about 20 km north of the pipeline route. In general, surface water pollution levels are low throughout the Project area. Most contaminants tend to bind to sediment particles and as a result remain in suspension for a limited time.

The Pacific Northwest, which includes the Project area, is an area of known seismic activity. The seismic hazard assessment used for the design of the Project was made using the services of the Pacific Geoscience Center of the Geological Survey of Canada. Seabed surveys conducted along the proposed route identified possible geohazards such as active faults, boulder fields, areas subject to debris flows and areas which may be prone to liquefaction.

Liquefaction

Liquefaction is a phenomenon in which the strength and stiffness of a soil is dramatically reduced when it is shaken such as occurs during earthquakes, blasting or driving piles. Sandy soils that are loosely packed and saturated with water are most at risk. When subjected to cyclic loads, the soil particles can lose contact with each other and the soil turns into a heavy fluid with a very low strength. Pipelines must be designed to resist or avoid forces resulting from soil liquefaction phenomena such as slope failures, large soil movements, soil spreading, soil settlement, floating or loss of foundation support.

3.1.2 Marine Biological Environment

Biodiversity within the Project area is relatively high. It is estimated that within the Pacific Northwest, there are up to 7,000 invertebrate species, 400 species of fish, 200 species of marine birds and 30 species of marine mammals. There are also approximately 645 species of marine algae and seagrass. Types of marine habitat within the Project area include shoreline and intertidal habitat at the Manley Creek landfall, nearshore subtidal habitats, and deepwater habitats.

Shoreline habitat at the landfall is characterized by a gently sloping intertidal zone extending out from a steep vegetated bluff. The intertidal substrate comprises mixed cobble, gravel and sand, with patchy boulder distribution. Several attached algae species are common in the intertidal zone, along with various invertebrate species, such as barnacles, mussels, clams and crabs, that live both on and in the substrate. At its lowest point, the intertidal zone encounters the southern tip of an extensive eelgrass bed that extends north over parts of Boatswain Bank.

Nearshore subtidal habitat occurs from the low tide mark seaward to a depth of approximately 35 m, the rough depth limit of marine algae in the Project area. The most significant nearshore subtidal habitat in the Project area is Boatswain Bank, which

is a shallow, submerged landform covered by fine sediments, sands and gravels with extensive areas of eelgrass and brown, red and green algae. GSX PL described the bank as having a higher diversity of species than other similar habitats located in the Saanich Inlet. It is a highly productive area for crab and numerous other invertebrate and vertebrate species. Eelgrass, one of the few groups of flowering plants in the marine environment, is a particularly important part of this ecosystem as it provides habitat for a range of attached algae, invertebrate and fish species. Another significant nearshore habitat area along the pipeline route is Cape Keppel on the southern tip of Saltspring Island. At this point the pipeline route traverses a submarine slope, which features coarse substrate species, such as bull kelp on the upper slope and soft bottom species at the toe.

Much of the proposed route is situated in deepwater habitat. Sand and clay/silt substrate occur over 90 per cent of the proposed alignment (e.g., Satellite Channel in the vicinity of ER 67). These deep water soft bottom substrates generally support comparatively low abundance assemblages of marine life. Typical species found in this habitat include Dungeness crab, shrimp, various flatfish, sea pens and weathervane scallops. Greater abundance and diversity are generally present in areas of hard bedrock/boulder/cobble substrate where currents are stronger. Conspicuous marine life in these areas includes sponges, hydroids, hydrocorals, cup corals, swimming scallops, sea urchins, barnacles, and sea stars. One of the most significant hard-bottomed features in the Project area is Patey Rock, which is located approximately 0.5 km south of the proposed route. This feature is associated with a fringing kelp forest and supports a high diversity of invertebrate and vertebrate fauna, including a cloud sponge colony, lingcod, rockfish, kelp greenling, brittle stars, shrimp and anemones.

A total of 11 marine mammal species are known to be present on a seasonal basis within the Project area. The killer whale, harbour porpoise and Stellar sea lion are particularly notable as they are listed as either vulnerable or imperiled species by the BC Conservation Data Centre. The southern community of resident killer whales, which is classified as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and occasional transient killer whales have been observed in the Project area. Recent studies on harbour porpoise distribution conducted by researchers from Washington State were provided to the Panel by the Marine Coalition. Results of this work show that harbour porpoise are common in the waters of the southern Strait of Georgia but little is known about the biology of this species. Stellar sea lions migrate through the Strait of Georgia during the winter months and are known to use haul-out sites at the mouth of Saanich Inlet.

The Strait of Georgia, including the proposed pipeline route, is an important migratory stopover and overwintering area for a large number of marine and shorebird species. The intertidal and nearshore area in the vicinity of Boatswain Bank is a designated waterfowl wintering area. Typical resident and migratory birds found along the alignment include cormorants, bald eagles, various ducks and scoters, grebes and gulls. The great blue heron, which is considered to be a vulnerable species in BC, is known to feed in the eelgrass habitat found on Boatswain Bank.

3.2 Terrestrial Environmental Setting

The Project is located within the Nanaimo Lowland of the Georgia Depression of Vancouver Island. Elevations along the proposed route are less than 150 m, with the exception of Cobble Hill, which rises to over 300 m. Most of the geomorphic features in the area are a result of structural, erosional and depositional processes, such as folding and faulting of bedrock, glaciations and changes to sea level. At the Manley Creek landfall, the Nanaimo Lowland is bounded by a steep, erodible sea cut bluff.

The surficial geology of this area of Vancouver Island is predominantly characterized by glacial and alluvial processes, and consists of primarily glacial till and outwash sand. Nearshore areas of the coastal plain typically have glacial deposits that overlay older marine silts and clays. Moving inland, the glacial till becomes thinner and bedrock exposures become more evident. The route is characterized as predominantly agricultural in the eastern half and forested throughout the western half.

Watercourses in the vicinity of the proposed route are very small by regional standards. Most watercourses are considered to be ephemeral and only carry water during the winter rainy season. Wetlands in the area are also very small by regional standards, and have experienced considerable effects from agriculture or industrial use. Shallow groundwater is present in some locations, particularly as perched water tables above fine grained glacial till or marine sediments. The area also has a number of deposits that act as reservoirs for groundwater. The proposed pipeline route would traverse lands overlying five aquifers, in both unconsolidated deposits and consolidated bedrock.

The route traverses two biogeoclimatic zones, namely the Coastal Douglas Fir (CDF) Biogeoclimatic Zone from the landfall to Cobble Hill, and the Coastal Western Hemlock (CWH) Zone from Cobble Hill to the interconnect with Centra. The majority of the forests in the CDF Zone have regenerated after logging in the 1800s. The coastal variety of Douglas fir is the most common species in upland forests with western red cedar, grand fir, arbutus, Garry oak and red alder occurring frequently. CWH Zone features are western hemlock, a sparse herb layer and the predominance of several moss species.

Extensive human activities, such as forestry, settlement, agriculture, and transportation, have altered the physical structure of most of southeastern Vancouver Island.

3.3 Socio-Economic Setting

The marine portion of the route passes through a mixture of commercial and recreational fishing areas, shipping and marine transportation routes, as well as recreational and ecotourism areas. The terrestrial portion passes through a mixture of agricultural, residential and forestry land, as well as recreational use areas. Agricultural and residential parcels range from larger farms to smaller hobby farms and residential acreages. The Crown, forest harvest companies and various private landowners own the forested parcels.

Although forestry is the main economic driver in the region, tourism and retirement-related services are also becoming important. Pension and investment incomes have become important as the number of retirees in the area has increased. The area benefits from its location midway between Nanaimo and Victoria, with many of its communities serving as bedroom communities to the larger centres. GSX PL submitted that the population in the area is projected to continue to grow.

A wide range of services is available in the local area, including government-sponsored services such as health, social services, fire, ambulance, law enforcement, water and sewer, and recreation; community-sponsored services such as churches and support groups; and an assortment of other services provided by the private sector.

Eight First Nations claim their traditional territory lies within the Project area. These are: Cowichan Tribes, the four member First Nations of the Sencot'en Alliance (the Pauquachin, Tsartlip, Tsawout and Semiahmoo First Nations) and the Malahat, Tsawwassen and Tseycum First Nations. Five of these First Nations have asserted Douglas Treaty rights.

4. Effects On Marine Valued Ecosystem Components

4.1 Biodiversity and Ecosystem Considerations

The maintenance of biodiversity is a major factor in ecosystem integrity. It is generally accepted that biodiversity considerations are a critical element of environmental assessment and should be incorporated into all steps of the environmental assessment process. Along with the focus on biodiversity, there is a need to address ecosystem considerations in environmental assessment, in particular species/community associations and interactions.

Intervenors expressed concern with the analysis of biodiversity and ecosystem issues associated with the Project. For example, the Marine Coalition submitted that species/community associations and interactions were not adequately addressed, particularly the dependence of various waterfowl (e.g., great blue heron) and fish (e.g., juvenile lingcod) species on eelgrass habitat at Boatswain Bank.

The Marine Coalition was of the opinion that baseline studies that were focused on seasonal aspects of the marine environment would have been useful to address this issue.

Biological Diversity

"Biological diversity is the variety of species, the genetic composition of species and communities, ecosystems and ecological structures, functions and processes at all levels" *(Biodiversity Convention Office. 1996. A Guide on Biodiversity and Environmental Assessment. Research and Development Report Series, Canadian Environmental Assessment Agency, Hull, Quebec).*

Some participants in the Marine Technical Conference also questioned the adequacy of seasonal baseline information on eelgrass communities and other benthic habitats in the Project area as shown in the consensus statements reached by participants for the benthic flora and fauna sessions.

"It is our submission that, in order to identify the environmental effects of this project, the significance of effects and possible cumulative environmental effects, the matters to be addressed by GSX in their Environmental Impact Assessment should have included not only what species would be impacted by the project, but also what communities and ecological processes would be affected. They should have addressed the historical trends, cumulative losses of species and habitats and whether critical thresholds or levels of capacity are being reached. They should have determined how much habitat would be eliminated or degraded, including short-term use areas. They should have provided the Panel with the information it needs in order to determine how and to what extent the potential environmental impact of the project will affect biological diversity and the cumulative environmental effects of the project. And to do so they should have sampled over more than one or two years and conducted studies during all seasons using standardized protocols for these purposes. We propose to demonstrate to you that with respect to these matters and others to which we will come in due course, GSX's EIA, and, by extension, its application, is seriously deficient."
(Marine Coalition, JRP Hearing Transcripts, 18 March 2003, Volume 16, Para 25098)

GSX PL conducted a number of baseline studies aimed at characterizing marine biodiversity (i.e., species diversity and ecosystem structure). A total of 29 marine environmental reports were prepared by GSX PL to support its application. Several studies provided general and specific information on local biological communities and ecosystem function. For example, studies focused on benthic communities in Boatswain Bank and Cape Keppel/ER 67, and a remotely operated vehicle (ROV) survey of the entire marine pipeline route was carried out to support the development of habitat maps for the Project corridor. GSX PL stated that poor underwater visibilty was common along the proposed route. Observations on community structure and ecological associations were also made during a survey of the existing Centra pipeline. No seasonal data on biological communities were produced from these studies and ecological observations relied primarily on habitat associations. GSX PL is of the opinion that baseline information generated by these studies and other sources is sufficient to enable accurate impact assessment and the development of appropriate avoidance and mitigation measures. Furthermore, GSX PL has committed to pre- and post-construction eelgrass surveys in response to concerns by Intervenors.

The Panel concludes that the baseline studies, while adequate to predict Project effects, could have been better designed with a clearer focus on biodiversity and ecosystem concerns. However, the Panel is satisfied that avoidance and mitigation measures to be implemented by GSX PL during Project construction and operation would effectively serve to address potential biodiversity and ecosystem concerns raised by Intervenors. In particular, the use of the HDD process at the landfall area would avoid disturbance of the eelgrass community and its associated ecosystem components. The Panel notes that supplementary pre- and post-construction studies, such as the eelgrass surveys, would add further information to existing knowledge on local biodiversity. Recommendations the Panel has made with respect to pre- and post-construction studies provide an opportunity for GSX PL to implement an adaptive management strategy, if necessary, to satisfy the NEB that actual effects are adequately mitigated. Adaptive management would allow for continual improvement of practices, including mitigation measures, after evaluating their effectiveness following construction of the Project.

Pre-hearing Marine Technical Conference

In response to a request by the Marine Coalition in January of 2002, the Panel considered comments from the parties and decided to convene a pre-hearing conference on technical and scientific issues relating to the marine portion of the Project to be facilitated by a neutral third party. The objective of the pre-hearing marine technical conference (the conference) was to narrow differences on key technical and scientific issues associated with the marine portion of the Project, so as to help inform the deliberations of the Panel. The conference was convened on November 14 and 15, 2002 as a roundtable of qualified scientists and technical experts nominated by a planning team led by representatives of interested Intervenors, GSX PL, and government agencies. Panel staff assisted in the facilitation of the conference.

The planning team reviewed the scientific and technical issues related to the marine portion of the Project and identified four main discussion topics: benthic fauna, benthic flora, barriers and marine mammals. At the conference, participants worked together in a facilitated, non-adversarial forum using a joint problem-solving approach to explore the issues and identify areas of agreement and disagreement. The participants were encouraged to represent their area of expertise, not the views of any party. The participants reached a consensus for each of the four topics as summarized below:

Benthic Fauna

The physical impact of the pipeline on biodiversity of infaunal benthos will probably be limited to a narrow strip. Given that detailed infaunal sampling was limited to only two locations along some 45 km of pipeline, there are uncertainties about the extent, duration and significance of effects in that strip. A rigorous pre- and post- development infaunal monitoring program along the soft bottom pipeline route should be undertaken to address the uncertainties. Boatswain Bank is a biologically rich coastal area. The trench open cut landing option will directly affect a small proportion of the benthos of Boatswain Bank. Backfilling an open cut will restore the bottom habitat, which will be re-colonized within 2 years by many species. The time for recovery of harvestable resource species is uncertain.

Benthic Flora

It will be necessary to monitor the eelgrass on Boatswain Bank prior to construction. This is to ensure that baseline information is available in the event that the pipeline installation negatively effects the eelgrass community. Baseline monitoring should include appropriate reference sites. The monitoring protocol should be acceptable to both scientists and appropriate regulatory authorities. If open cut trenching is required, alternative methods should be explored to minimize the width of the linear impacts.

Barriers

If exposed, the GSX pipeline will function as both a potential barrier to movement and introduce hard surface biological community structure to an existing soft bottom community. Some detailed data in regard to the issues have been provided; however, there remain uncertainties. Pre- and post-construction studies are necessary to develop a better understanding of the nature, extent and impact. Information on the location of female Dungeness crab incubation grounds for crab populations proximate to the pipeline should be included in these studies. There will be a measurable impact (positive or negative). It is unlikely there would be a catastrophic impact. We encourage collaborative adaptive management programs, particularly since this area has been identified as a probable National Marine Conservation Area.

Pre-hearing Marine Technical Conference (continued)

Marine Mammals

Currently available evidence suggests that the pipeline will most likely have a small effect on orcas and harbour porpoises in its operating phase. Negligible direct effects would be expected if further study either confirms that high frequency noise recorded near the pipeline does not originate in the pipeline, or that the employed pipeline coating reduces high frequency emissions to ambient levels. It wasn't possible to reach agreement on the significance of a small effect to the endangered orca population and the harbour porpoise population, which already face many other environmental challenges. The construction phase was thought to have potential for a larger though temporary effect. This effect likely would be minimized if construction took place over the winter when orcas are rarely present and porpoises are not calving. There was no agreement on the magnitude or significance of this effect.[3]

4.2 Effects at Landfall and in the Nearshore Marine Environment

4.2.1 Horizontal Directional Drilling at Landfall

GSX PL intends to accomplish the transition from the marine pipeline segment to the terrestrial pipeline segment using the HDD method. This is the preferred option for installing the landfall section because of the minimal nearshore environmental effects associated with this method of construction. The drill trajectory originates in an upland area, approximately 230 m landward of the shoreline, and terminates at an exit point, approximately 430 m seaward of the shoreline, in approximately 21 m of water, that is beyond most sensitive ecosystems.

Intervenors noted that potential marine environmental effects associated with the HDD pertain primarily to the permanent loss or temporary disturbance of eelgrass habitat on Boatswain Bank. The major impact area would be in the vicinity of the HDD exit hole where suspended sediment and bentonite drilling muds could be transported to nearby eelgrass habitat. Sustained high suspended sediment levels could impair ecological function in eelgrass beds. Concerns were also expressed about potential effects on nearshore habitat from vessel operation and anchoring. In addition to suspended sediment, concerns were expressed about the potential toxicity of the drilling mud and the viscosifer agent to be used at the HDD marine exit point.

In response, GSX PL stated that the pipeline was deliberately routed to the south end of Boatswain Bank and in close proximity to the Chevron Hatch Point Terminal to avoid effects to eelgrass and kelp beds as well as other components of Boatswain Bank (e.g., geoduck beds, core crab area). To further minimize the effect on eelgrass and kelp beds within the Boatswain Bank nearshore area, the HDD has been designed to exit in 21 m of water below the zero chart datum, and most of the activities associated with pipeline tie-in would be carried out in deep water at a distance from the HDD exit point. The tie-in point is approximately 310 m beyond the nearest eelgrass bed and occurs in an area of sparse brown algae. A deeper exit was not believed by GSX PL to be geotechnically feasible. Furthermore, GSX PL stated that all habitat-related effects associated with the HDD would be covered under a Department of Fisheries and Oceans (DFO) *Fisheries Act* Section 35(2) Authorization, which would clearly specify mitigation and compensation requirements consistent with DFO's national Policy for the Management of Fish Habitat.

[3] Facilitator's Report of the GSX Canada Pipeline Project Pre-hearing Marine Conference 14 and 15 November 2002, Sidney, BC

In addressing toxicity concerns, GSX PL stated that the drilling mud and viscosifer agent are non-toxic, based on their use in drilling drinking water wells, but acknowledged that toxicity testing to demonstrate their effects on various marine organisms and associated life history stages had not been conducted.

To ensure that proposed avoidance and mitigation measures are implemented successfully, the Panel recommends that GSX PL provide a detailed site-specific environmental management plan prior to initiating HDD activities at the Manley Creek landfall. Furthermore, the Panel expects that GSX PL would include in the plan a provision to conduct a post-construction survey to quantify the predicted effect associated with the use of the drilling mud on marine vegetation at the HDD site and discuss options to mitigate any effects. The Panel concludes that, with the implementation of the proposed mitigation measures and the recommendation of the Panel, significant adverse environmental effects from the HDD are unlikely.

Recommendation 2

The Panel recommends that GSX PL file with the Board for approval, 60 days prior to initiating the horizontal directional drill (HDD) at the Manley Creek landfall, a detailed site-specific environmental management plan. The plan should:

(a) identify the potential hazards that could occur;

(b) identify all site-specific mitigation, habitat compensation, and monitoring requirements as required by Fisheries and Oceans Canada and Environment Canada;

(c) identify additional containment systems (e.g., booms and seafloor control devices) that would be used to minimize the potential for mud releases beyond the limits of the glory hole;

(d) specify that density adjustments to the drilling mud would only be made through the use of inert or non toxic materials;

(e) discuss and include any mitigation for launching the HDD pipe string; and

(f) include a monitoring plan to quantify the effects of drilling mud on marine vegetation at the HDD site.

4.2.2 Partial or Full Open Cut

The HDD has been identified as the preferred method of achieving the transition from the marine to terrestrial pipeline segments. Engineering and geotechnical studies indicate a 90 per cent likelihood of the HDD approach being successful. However, in the event that the Vancouver Island shoreline crossing cannot be accomplished using HDD, a partial HDD or full open cut method would be employed.

A partial HDD or full open cut of the landfall would raise many of the environmental issues the HDD would avoid. The partial HDD and the full open cut would require excavation through the foreshore area including shallow subtidal and intertidal zones. However, GSX PL proposed a revised alignment for the partial HDD or full open cut that would avoid eelgrass beds to the extent possible. On the basis of baseline habitat mapping studies, GSX PL concluded that the main impact zone would lie outside of the more productive eelgrass and demersal kelp habitats associated with Boatswain Bank. Some algae and a broad range of invertebrates would still be lost in conjunction with the disturbance along the ROW. This activity could potentially occur toward the end of the waterfowl over-wintering period and, therefore, have minor potential to disturb waterfowl and shore birds. However its location at the south end of Boatswain Bank and adjacent to the Chevron Hatch Point Terminal is expected to reduce this effect. It is further predicted that turbidity and siltation may reduce short-term productivity of neighboring eelgrass, kelp and algae.

In the case of a partial HDD, a bell hole would be required at the toe of the slope below the bluff within the intertidal zone. No disturbance to the vegetated slope would occur. For a full open cut, forest cover on the slope would be cleared from the ROW and a dragline or equivalent excavator used to trench the slope. In the absence of an intensive bank stabilization and reclamation

effort following full open cut construction, there could be a potential for chronic erosion and increased foreshore siltation and turbidity could occur. This latter outcome would result in proportionately more long-term effects on marine vegetation.

Intervenors, including DFO, expressed concern over potential effects to the marine environment from a partial HDD or open cut at landfall. Damage to local eelgrass habitat and kelp beds in the vicinity of Boatswain Bank was the major concern. The Marine Coalition raised the issue of potential vessel-anchor scouring, especially from larger vessels that could cause loss, fragmentation and alteration of habitat and be a limiting factor in the subsequent recolonization of bare areas.

GSX PL submitted that it had discussions with a local contractor working in this area who indicated that a spread of five anchors could be used instead of three or four to stabilize the barge so that there would not be excessive movement of the barge. GSX PL further submitted that when moving anchors of this nature, it has a policy that the anchors are picked up vertically.

To address possible effects to the marine environment, GSX PL prepared a landfall partial HDD and full open cut contingency plan as a component of its EPRP. The plan specifies routing to minimize disturbance to eelgrass habitat, commits to the use of silt curtains to reduce potential effects from siltation, and provides for a number of reclamation/restoration initiatives.

The Marine Coalition expressed concern related to GSX PL's potential mitigation measures to compensate for effects that could occur in the marine environment. For example, the Marine Coalition stated that projects resulting in beneficial effects for eelgrass, other than the proposed removal of the old gravel barge off the Hatch Point Reserve, could be done throughout the Islands Trust area. GSX PL responded by indicating that it welcomed suggestions for different compensation projects, but that it would have to satisfy any DFO requirements.

The Panel notes that all details of the *Fisheries Act* authorization have not been finalized. However, the Panel considers that GSX PL should fully explore any habitat mitigation and compensation options to enhance beneficial environmental effects to the marine environment.

The Panel concludes that the proposed HDD would likely be successful. In the event of a failed HDD, the Panel accepts the reclamation and restoration measures outlined in GSX PL's contingency plan for a partial HDD or open cut. However, to ensure the management of potential effects during construction, the Panel recommends that GSX PL not proceed with the partial HDD or open cut method at the landfall without developing a detailed site-specific crossing plan and an eelgrass monitoring plan that receives approval from the NEB. The Panel notes that Environment Canada and DFO would likely provide input to these plans.

The Panel concludes that, with the implementation of GSX PL's proposed mitigation measures and the Panel's recommendation, significant adverse environmental effects are unlikely should a partial HDD or open cut be required.

Recommendation 3

The Panel recommends that GSX PL not implement the open cut or partial horizontal directional drill (HDD) method as an alternative to the proposed HDD at Manley Creek until:

(a) GSX PL files with the Board detailed reasons why the HDD is not feasible or was not successful;

(b) GSX PL consults with Environment Canada and Fisheries and Oceans Canada, obtains all necessary permits and files a detailed site-specific, open cut or partial HDD crossing plan and an eelgrass monitoring plan that includes scaled drawings identifying all areas that would be disturbed by constructing the crossing; and

(c) receives written approval from the Board that an open cut or partial HDD crossing may begin.

4.2.3 Cape Keppel

The proposed routing takes the pipeline within approximately 130 m of the shoreline at Cape Keppel on the southern shore of Saltspring Island. At this point the pipeline is also at its closest to the boundary of ER 67, which is a provincially protected area. The pipeline installation plan proposes bottom lay installation where the pipe most closely approaches Saltspring Island and ER 67. To ensure the strength and integrity of the pipeline along the shore of Saltspring Island in the vicinity of Cape Keppel, GSX PL proposes to use drilled pilings to support the pipe and address geotechnical issues such as rock slope and potential fault-like features.

Baseline studies of the Cape Keppel area revealed vegetation and fauna species typical of semi-protected sediment shorelines of the southern Strait of Georgia, including commercially important species such as geoducks, clams and Dungeness crab. Potential adverse environmental effects on vegetation and fauna species identified by GSX PL include disturbances associated with the activities of drilling piles and touchdown of the pipe on the bottom, noise from the drilling and pipe laying operation, barrier effects of the pipe lying on the bottom and associated commercial (including First Nation) fishery concerns.

First Nations expressed concern over potential effects to valued shellfish and marine plant resources at Cape Keppel, which they claim is within their traditional territory. These concerns were also expressed by DFO.

GSX PL predicted that there would be some direct loss of benthic communities in areas contacted by the pipe or the pilings, and communities in the immediate vicinity would be affected by modest amounts of sediment displacement associated with these activities. Direct losses are not expected to have notable effects on overall populations or habitat supply as the pipeline represents a small and simple structure passing through a typical shoreline environment. Sediment-tolerant benthic communities are located in areas of active sediments and dunes along the proposed pipeline route and, as such, they are expected to quickly recover from construction associated sedimentation. Noise related effects, mitigated by minimizing construction time spent in the area, would end with completion of the pile drilling and pipeline installation through this segment. Effects to commercial fisheries were also anticipated to be generally limited to the construction period.

GSX PL argued that the installation in the vicinity of Saltspring Island and ER 67 would not result in any significant adverse environmental effects given the small size and simplicity of the pipeline, combined with the anticipated settling in and spanning of sections, available habitat supply and anticipated level of biologic response. Furthermore, GSX PL committed to providing compensation to prawn trappers in the Cape Keppel area if their operations are disrupted during installation of the pipeline. GSX PL stated that mitigation and compensation for marine habitat damage at Cape Keppel would be addressed through a *Fisheries Act* Section 35(2) Authorization. Finally, GSX PL committed to using post-construction ROV monitoring of the pipeline to identify any unexpected residual effects.

The Panel considered the potential effects of the Project in the vicinity of Cape Keppel and the likelihood of these effects actually occurring. The Panel notes that effects from construction would occur to benthic habitats as a result of the pipeline being placed on the slope of Cape Keppel. However, any effects would generally be short-term with the exception of the physical presence of the pipe itself on the slope. Some species (i.e., those that prefer hard-bottom habitats) may experience beneficial effects due to the presence of the pipeline. The Panel notes that the area is predicted to recover rapidly as organisms colonize the pipe.

Given the concerns with the maintenance of the physical and biological integrity of the marine environment at Cape Keppel, the Panel recommends that GSX PL conduct pre- and post-construction monitoring and follow-up programs to assess the effectiveness of mitigation measures and to verify the accuracy of assessment predictions.

The Panel concludes that, with the implementation of the mitigation measures and the recommendation of the Panel, significant adverse environmental effects at Cape Keppel are unlikely.

Recommendation 4

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of marine pipe lay operations, a detailed pre- and post-construction monitoring and follow-up program. The plan shall include scientifically rigorous criteria to be used to verify the accuracy of the environmental assessment predictions and to assess the effectiveness of the mitigation developed for benthic flora and fauna along Cape Keppel near Ecological Reserve 67. Copies of all correspondence and minutes of meetings demonstrating consultation in developing the plan with appropriate regulatory agencies, including Fisheries and Oceans Canada, shall be provided. The follow-up program will include a schedule for filing reports to the Board.

4.3 Effects on Marine Offshore Environment

4.3.1 Benthic Communities

4.3.1.1 Direct Mortality and Alteration of Habitat

Direct mortality or functional impairment of benthic marine invertebrates could occur as a result of physical trauma associated with pipe laying and trenching (ploughing or jetting), or from smothering caused by sediment displacement. A second concern is the potential to remobilize contaminants contained in the sediments as a result of disturbance during pipeline construction. In addition to direct physical disturbance associated with construction and sediment displacement, the Project has the potential to alter benthic habitat. Habitat alteration could occur in one of two ways: either by covering formerly hard-bottom habitats with finer grained material or by creating new hard-bottom habitat where the pipe is exposed or where rocky material is brought to the surface.

The physical disturbance caused by trenching and smothering from the trench berm and sediment plume were the primary potential effects to deepwater benthic communities of concern to most Intervenors. Depending on the trenching method used and the size of the organism, biota could be deposited between 3 m (ploughing) and 300 m (jetting) from the trench and buried under 20 cm (ploughing) and 1 cm (jetting) of sediment. The Marine Coalition expressed particular concern for benthic communities that could be affected in the vicinity of ER 67. During the Marine Technical Conference, it was noted that the limited amount of sampling carried out by GSX PL on benthic communities along the deepwater portion of the pipeline makes it difficult to characterize the infaunal community that could be affected. In particular, the Marine Coalition indicated that rare and sensitive species could have been missed during the baseline sampling program.

> **". . . . I noted that only two small areas were assessed for infauna along some 40 km of soft bottom along the pipeline route."** ***(Direct Evidence of the Marine Coalition Appendix B. Review of Benthic Infauna & Associated Background Documents, p.4)***

GSX PL predicted that there would be a minor loss of marine invertebrates as a result of physical trauma, sedimentation and smothering during construction of the pipeline. This

impact is anticipated to affect considerably less than 1 per cent of marine biota within the surveyed area and was characterized as being similar to effects already occurring in the area as a result of routine commercial and recreational fishing. Similarly, GSX PL expected that trenching of the pipeline would result in a localized and short-term disturbance of soft-bottom habitats in an area where these same habitats are routinely subject to frequent disturbance by activities such as bottom trawling, crab trap hauling, and anchoring. Further, GSX PL expects that disturbance of unique sites or communities is unlikely and that effects of elevated turbidity and sediment displacement would be temporary and localized. Elevated turbidity would likely be limited to one or two days following activity in any given location. Associated soft-bottom benthic communities are anticipated to recover within about two years.

Several Intervenors expressed concerns about GSX PL's ability to predict accurately the extent of potential effects and the length of the recovery period. In this regard, they recommended further baseline studies and the application of the precautionary approach with respect to Project implementation. The Marine Coalition also noted that there might be effects to crabs and crab maternity areas from drilling muds and related sedimentation at the HDD exit point. In response, GSX PL conducted a crab maternity reconnaissance survey of Boatswain Bank in the vicinity of the proposed HDD exit point in January-February of 2003. The timing of the study was based on discussions with DFO and local crab fishers. Based on the results of this preliminary study, GSX PL predicted that a relatively small number of brooding females would be affected by any habitat alteration resulting from Project activities in the Boatswain Bank area. Although there remains some uncertainty concerning the concentration of brooding female crabs that would constitute a maternity area, GSX PL considers further study of this issue unnecessary. Supplemental pre-and post-construction marine inventory and monitoring activities planned by GSX PL in the Boatswain Bank area may provide additional data on local crab abundance and distribution.

Over decades, chemical contaminants, through sediment transport mechanisms, may have settled in areas where trenching is proposed. Jetting, in particular, may act to remobilize these contaminants with the possible effect of making them bio-available. Particular concerns were identified by Intervenors about the possibility of toxins being transported up the marine food chain to killer whales resident in the southern Strait of Georgia.

With respect to the remobilization of contaminants during pipeline trenching activities, GSX PL carried out a limited bottom sediment sampling program in the vicinity of the Manley Creek landfall. Results of the testing showed that sediment samples were not markedly contaminated and met the Ocean Disposal Criteria and Guidelines. GSX PL maintains that based on these sample results and other factors, such as the physical proximity of potential pollution sources to the pipeline route and local water circulation patterns, it is highly unlikely that significant levels of contamination exist in any sediments that will be disturbed by the Project. Further to this conclusion, Environment Canada has not identified any likely source of sediment contamination along the pipeline route.

The Panel concludes that physical effects from the pipeline on deepwater benthic communities would be limited in most areas to a narrow strip and that recovery times would vary, but long-term effects would be minimal. The commitment by GSX PL to conduct follow-up ROV surveys along the pipeline at specified intervals after Project construction will help to verify the accuracy of effects predictions and highlight any additional mitigation requirements.

However, uncertainties remain concerning the potential for contaminant remobilization during the jetting process. The potential for contaminants to be remobilized, widely distributed and made bio-available through

the jetting process is of concern to the Panel. Therefore, the Panel recommends that a pre-construction sediment sampling program be implemented in the event that GSX PL identifies jetting as the preferred trenching method. Should contaminants in excess of the Guidelines be discovered, GSX PL would have to develop, in consultation with Environment Canada and DFO, mitigation measures to minimize sediment remobilization or consider a construction method other than jetting. In the Panel's view, this would ensure that any residual remobilization of contaminants would not combine with other projects and activities to create significant adverse environmental effects.

The Panel concludes that, with the implementation of the proposed mitigation measures and the recommendation of the Panel, significant adverse environmental effects arising from direct mortality or alteration of habitat are unlikely to occur to benthic communities.

Recommendation 5

Should the jetting construction method be considered for the marine portion of the pipeline, the Panel recommends GSX PL file with the Board for approval, at least 60 days prior to the commencement of marine pipe lay operations, the results of a specific sediment sampling plan for areas of the pipeline considered for installation using the jetting construction method. This report should include:

(a) a detailed statistically valid sampling protocol;

(b) the results of the sediment sampling plan, indicating whether sediment in excess of Environment Canada's (2000) Interim Contaminant Testing Guidelines is discovered;

(c) all mitigative measures GSX PL would implement should it be found that sediment in excess of Environment Canada's (2000) Interim Contaminant Testing Guidelines exists in the area that could be affected by the project;

(d) copies of all correspondence and minutes of meetings demonstrating consultation in developing the plan and mitigative measures with appropriate regulatory agencies, including Environment Canada and Fisheries and Oceans Canada; and

(e) criteria to verify the accuracy of the environmental assessment predictions and to assess the effectiveness of the mitigation.

4.3.1.2 Reef Effect

Installation of the proposed pipeline would create a new hard-bottom substrate on the seabed in the form of the pipe itself, as well as turning up new substrate where it is potentially ploughed or jetted in. In both cases an artificial "reef effect" would occur, which would attract a variety of invertebrate and vertebrate species. During a reconnaissance survey conducted in the summer of 2000, GSX PL observed a minimum of 19 taxa of marine invertebrates colonizing or closely associated with the Centra pipeline, which runs from Vancouver Island to the mainland. Potential effects from the reef effect relate mainly to possible changes in predator/prey relationships that result from attraction of predator species and other organisms to the new hard-surface habitat and effects on the adjacent community of existing soft-bottom organisms. One possible concern identified by Intervenors was increased predation of crabs by octopus and skate that would use the pipeline as cover.

With respect to commitments and associated follow-up surveys/studies, GSX PL stated that periodic monitoring of reef effects and benthic habitats would be carried out using a ROV video monitoring system. There was also a commitment to employ more sophisticated technology in the monitoring program (e.g., manipulator arm for sample collection, laser measurement device, and higher definition digital video).

The Panel believes that significant adverse environmental effects on benthic communities from reef effects are not likely, although an

effect (positive or negative) is expected. Reef effects would be restricted to a relatively narrow strip along the sea bottom. In areas where the pipe is trenched, burial or natural infilling will mean any effects would be temporary. A monitoring program that includes pre- and post-construction studies has been identified as a way to measure effects on the existing soft-bottom benthic community.

Recommendation 6

The Panel recommends GSX PL file with the Board for approval, at least 60 days prior to the commencement of marine pipe lay operations, a follow-up program to verify the accuracy of the environmental assessment predictions in relation to reef effects. Copies of all correspondence and minutes of meetings demonstrating consultation in developing the program with appropriate regulatory agencies, including Environment Canada and Fisheries and Oceans Canada, shall be provided. The follow-up program shall include a schedule for filing reports to the Board.

4.3.1.3 Barrier Effect

A number of Intervenors, including commercial crab harvesters, expressed concern that a bottom-founded pipeline may interfere with the movement and behaviour patterns of marine benthic organisms such as Dungeness crab, California sea cucumber and the green sea urchin, and thus create a "barrier effect" for these organisms.

Initial efforts by GSX PL to assess potential impacts from the barrier effect included a literature review and several laboratory studies to assess potential interaction of Dungeness crab and other benthic organisms with the pipeline. GSX PL concluded from these studies that there may be a short-term barrier effect on Dungeness crabs (particularly small crabs and females) from a fully exposed 53 cm outside diameter concrete-coated pipeline. There was also some indication that short-term crossing of the pipeline may be enhanced by burial or wrapping. At the Marine Technical Conference, it was concluded that the barrier effect would not result in a catastrophic impact but that adaptive monitoring and management initiatives would be necessary during the post-construction period. In this regard, GSX PL has committed to conducting pre- and post-construction crab trapping and tagging studies along selected portions of the pipeline route.

Initial measures put forward by GSX PL to mitigate any potential barrier effects include abrasion resistant pipeline coating, trenching in designated locations along the route, free spans, and the placement of articulated concrete mattresses that would allow for passage of benthic organisms. Based on discussions at the Marine Technical Conference, GSX PL decided not to use concrete mattresses as a mitigation measure with respect to the barrier effect; however, concrete mattresses would still be used for engineering purposes to mitigate excessive free spans and to ensure the integrity of the pipeline.

The Marine Coalition expressed concern with what it considered to be deficiencies in the GSX PL baseline information, particularly with respect to mobile epifauna in the Project area. Baseline information were seen as inadequate to accurately assess potential barrier effects on mobile epifauna, particularly crab species other than Dungeness crab. Federal Intervenors also highlighted the barrier effect as an issue of significant concern. Some Intervenors were critical of the design and approach to implementation of several experiments conducted in a laboratory environment by GSX PL to assess potential barrier effects.

As expressed by DFO, there is uncertainty concerning the distribution and movement of crab species in the Project area, particularly in the deeper water environments. DFO submitted that baseline information on benthic communities provided by GSX PL is based primarily on habitat associations and observations made during ROV surveys and does not make a significant contribution to understanding local crab ecology. In light of this general uncertainty with respect to local

crab distribution and movement, DFO has adopted the Precautionary Principle when specifying conditions for Project approval. These conditions have been discussed and, for the most part, GSX PL is in agreement.

In response to these concerns, GSX PL committed to trench the entire Canadian portion of the pipeline route at depths less than 110 m where trenching is practical. In areas that are less than 110 m in depth but trenching is not practical for safety or pipe integrity reasons, the pipeline would be wrapped with a plastic geotextile mesh to facilitate organisms crossing the pipeline. In areas where the pipeline is trenched, DFO submitted that GSX PL would ensure that the pipeline is buried to a minimum of 50 per cent of its diameter. Burial to 50 per cent diameter would need to occur for no less than 50 per cent of each 100 m linear section of the pipeline. Follow-up monitoring and mitigation would also be carried out to ensure adequate burial and to undertake backfilling operations where trenching specifications have not been met. In the event that the Project proceeds as proposed, these commitments would be formalized by DFO in an Authorization under Section 35(2) of the *Fisheries Act*.

Further to these commitments by GSX PL, DFO has indicated that it would require mitigation measures, such as mesh wrap, in areas beyond those discussed above. In particular, there may be a requirement to mesh wrap exposed pipe in areas deeper than 110 m. The location of these sections would depend on available species distribution information and site-specific conditions, such as the absence of free spans and the composition of the seabed.

The Panel considered the potential barrier effect of the pipeline and GSX PL's mitigation measures. The Panel notes that the pipeline would be installed via trenching in specific locations and monitoring would be carried out to ensure the appropriate level of burial in trenched areas. Further, the pipeline would have an abrasion resistant coating and would lie above the sea-bed where free span sections occur. These measures would mitigate barrier effects to a certain extent. In areas that would not be trenched, the abrasion resistant pipeline coating and the use of geotextile mesh wrap at water depths of less than 110 m would likely be adequate to mitigate the barrier effect. Additionally, the Panel notes that GSX PL has committed to carrying out crab trapping and tagging studies in consultation with DFO to assist in evaluating any barrier effect.

Given the concerns of the public and Intervenors, the Panel recommends that a follow-up plan is needed to verify the accuracy of the environmental assessment predictions and to assess the effectiveness of the mitigation developed for reducing barrier effects to benthic communities. The Panel concludes that, with the implementation of the proposed mitigation measures and the recommendation of the Panel, significant adverse environmental effects due to the barrier effect of the pipeline are unlikely.

Recommendation 7

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of marine pipe lay operations, a follow-up program on barrier effects. The follow-up program shall include:

(a) a schedule for filing subsequent reports with the Board which verify the accuracy of the environmental assessment predictions and assess the effectiveness of the mitigation developed for reducing barrier effects to benthic communities and include any further mitigation proposed by GSX PL;

(b) copies of all correspondence and minutes of meetings demonstrating consultation with appropriate stakeholders, including, but not limited to, Environment Canada, and Fisheries and Oceans Canada, in developing the follow-up program;

(c) a detailed approach to ensure that, in areas where the pipeline is trenched, a minimum of 50 per cent of its diameter for no less than 50 per cent of each 100 m linear section will be buried; and

(d) an outline and schedule of the reports to be submitted on the results of year 1, 2, 3 and 5 post-construction crab trapping and tagging studies, and year 7 if deemed necessary by Fisheries and Oceans Canada and the reports shall include any further mitigation proposed by GSX PL.

4.3.2 Fish

Potential environmental effects on fish from pipeline activities identified by GSX PL include: direct effects through turbidity and mortality; habitat alteration; and sensory disturbance. GSX PL concluded that most adult fish possess sufficient mobility to avoid being crushed by pipe lay and trenching operations. In addition, most potentially affected fish species have free-floating, often pelagic eggs and larvae, which should also not be vulnerable to burial or substantial direct mortality. Soft-bottom fish habitats could be temporarily altered as a result of pipe trenching. However, GSX PL predicts that rapid sediment covering of the pipe in the trench and subsequent more gradual natural infill of the trench would result in the functional restoration of the structural and biological productivity of these communities for fish. Where the pipeline is exposed, new long-term hard-bottom substrate would be created on the seabed. In these areas, a reef effect is likely to occur and the pipe can be expected to be colonized to varying degrees by, or to otherwise attract, a variety of fish species (e.g., rockfish, sculpin, lingcod). The Project would generate noise as a result of vessel traffic, pipeline trenching and pipeline operation. GSX PL concluded that there is no available evidence to suggest that these noise sources would be responsible for changes in long-term fish abundance or distribution.

With respect to potential effects from the Project on marine fish species, the Marine Coalition argued that deficiencies in baseline information collection and analysis by GSX PL have resulted in a failure to recognize the significance of possible effects on certain marine fish, including lingcod and spiny dogfish. The Marine Coalition submitted that these two species migrate from deeper water and offshore rocky substrate to eelgrass beds at critical times in their life cycle. In this regard, the pipeline could bisect the migratory paths of these two species as they move to and from the eelgrass habitat on Boatswain Bank. The Marine Coalition states that site-specific seasonal ecological studies are needed to accurately determine direct and cumulative effects of these fish species and their potential loss to the eelgrass ecosystem.

The Panel concludes that potential effects through turbidity and mortality, habitat alteration, and sensory disturbance to deepwater marine fish from the proposed pipeline would not likely be significant. The Panel further concludes that significant effects on lingcod populations are unlikely during any part of their life cycle. In general, lingcod are known to inhabit rocky areas and sub-tidal reefs. The recreational fishery for lingcod in the Strait of Georgia is closed from October to May to protect nest guarding males. After hatching, larval lingcod are pelagic until mid- to late-summer when they settle on the sea bottom in eelgrass or kelp beds. Assuming that most of the Project construction activity in the deepwater areas would be conducted between October and April, it is unlikely that any of the early life history stages of lingcod along the proposed route would be significantly affected.

4.3.3 Marine Birds

GSX PL identified a possible direct loss of marine birds if there was an accidental fuel spill associated with Project activities. Potential ecosystem effects were not considered to be an issue unless a partial HDD or full open cut is needed if the HDD at Manley Creek landfall fails.

The Marine Coalition submitted that there is a deficiency in the GSX PL baseline information with respect to the ecological relationships between marine birds and the environment at Boatswain Bank and elsewhere in the Project area. A wide range of seabirds, shorebirds and waterfowl are found at various times of the year in the vicinity of Boatswain Bank. Of particular concern are the great blue heron and the California gull, both of which are COSEWIC listed species. The lack of appropriate

ecological baseline information was considered by the Marine Coalition to affect the accuracy of GSX PL's environmental assessment predictions and the development of effective avoidance and mitigation strategies.

GSX PL stated that the Project offset distances from primary bird concentration areas, the small scale of the Project, the scheduling of activity outside of the peak overwintering period, the short-term potential effects and the contextual background (e.g., in an area of very active commercial and recreational vessel traffic and human activity) indicate that the Project is not likely to cause significant adverse environmental effects on seabirds, shorebirds or waterfowl.

The Panel concludes that direct loss of marine birds during Project construction and operation is highly unlikely. Short-term disturbance of marine birds in the immediate Project area would result from construction activities. However, the Panel is of the view that it is unlikely the effects would be significant. Assuming that the landfall is achieved using the HDD method, significant effects are not likely to shorebirds and marine birds that use the intertidal and shallow subtidal areas in the Boatswain Bank area. Further discussion of potential effects to great blue heron is provided in section 5.7. In the event a partial HDD or open cut is needed in place of the HDD, the Panel has recommended that GSX PL provide, for approval by the NEB, a detailed, site-specific plan identifying proposed activities and any mitigation measures (Recommendation 3). The Panel concludes that, with the implementation of GSX PL's contingency plan, proposed mitigation measures and the Panel's recommendation, significant adverse environmental effects are unlikely should a partial HDD or open cut be required.

4.3.4 Marine Mammals

Marine mammal species of particular concern in the Project area include the southern resident population of killer whales, harbour porpoises and Stellar sea lions. GSX PL stated that some potential exists for vessel traffic noise associated with pipeline construction or operation to be detected by marine mammals and to disturb them. Many marine mammals, whales and porpoises in particular, rely on sound for communication, for seeking and tracking prey, and for navigating. The potential adverse effects of increased noise (e.g., sound and frequency changes) on marine mammals include permanent deafness, temporary threshold shifts and reduced sensitivities, stress, and behavioral responses such as orientation away from the sound or a cessation of feeding. Baseline information collected by GSX PL includes noise measurements recorded near the Centra pipeline, development of a mathematical model derived for a pipe similar to the Project's, and a literature search on the nature and significance of pipeline construction and operational noise on marine life. GSX PL submitted that the issue of possible effects of acoustic noise from the operating pipeline on resident odontocete (e.g., killer whales and harbour porpoises) population is primarily confined to effects on killer whales echolation activities, largely because of the rarity of mysticete (i.e., baleen whales) in the area and the higher frequencies associated with the auditory threshold of most of the other relevant odontocete species. GSX PL further submitted that ambient ocean noise rather than the absolute threshold detection usually would limit detection of any pipeline noise by baleen whales and other infrasonic species.

Marine mammal issues were highlighted and discussed at the Marine Technical Conference. Participants concluded that available evidence suggests that the Project would most likely have a small effect on killer whales and harbour porpoises during its operating phase. However, it was not possible to reach agreement on the significance of a small effect to the endangered killer whale population and the harbour porpoise population, which already face many other environmental challenges. The construction phase was thought to have potential for a larger, though temporary, effect. This effect likely would be minimized if construction took place over the winter when killer whales are rarely present and porpoises

are not calving. Again there was no agreement on the magnitude or significance of this effect.

Intervenors including Parks Canada and the Marine Coalition expressed concern over the potential ecological effects of the Project on marine mammals. Parks Canada was concerned about the potential for acoustic disturbance from an operational pipeline to significantly impair the echolocation range of whale and porpoise species and, therefore, their ability to feed, to reproduce and to restore their populations to historic levels. Parks Canada suggested that killer whales and porpoises in the southern Strait of Georgia may already be heavily stressed and that further cumulative effects assessment is required to determine the potential significance of Project effects. The Marine Coalition expressed similar concerns but focused also on the possibility of effects occurring to marine mammals from disturbances generated during the construction phase of the Project. Other related concerns included the lack of appropriate baseline information and analysis, and a failure to adequately consult with qualified marine mammal experts such as DFO marine mammal scientists. Finally, it was suggested that more information is needed concerning the potential for the remobilization of contaminated sediments during Project construction activities and the possible effects this may have on marine mammals.

Results of recent field and laboratory studies conducted by GSX PL on acoustic properties of underwater pipelines strongly suggest there is no evidence that the operating phase of the Project would introduce acoustic noise at high or low frequencies that would be detectable by odontocetes (i.e., killer whales and harbour porpoises) present in the Project area. Specific avoidance and mitigation measures committed to by GSX PL include post-construction noise measurements along the pipeline to verify model predictions, marine mammal awareness training for marine contractors, and a marine mammal reporting system that would help to keep Project vessel operators informed of marine mammal presence in the work area. GSX PL offered to develop these activities in conjunction with experts from DFO as well as other concerned individuals or groups. GSX PL undertook to ensure that contractors are familiar with and adhere to US protocols for vessel operation in the proximity of marine mammals. A commitment has also been made by GSX PL to participate in any centrally coordinated multi-stakeholder initiative to monitor and reduce cumulative effects on marine mammals in the Strait of Georgia. Finally, GSX PL has stated that it would confine construction activities for the marine portion of the pipeline to the period between October and April if possible. As noted during the Marine Technical Conference, this would substantially reduce any potential effects on marine mammals of concern in the Project area.

Further to the marine construction window proposed by GSX PL, DFO stated during the oral hearing that in areas other than the foreshore the window should be between November and March and that this timing would be made a condition of any *Fisheries Act* authorization required by GSX PL prior to Project start-up. This compression of the October to April window proposed by GSX PL is a concern to the company and it has indicated that it will hold further discussions in this regard with DFO.

GSX PL concluded that, due to the small scale, short-term and contextual background (i.e., considerable commercial and recreational vessel traffic already occurs in the Project area) of the proposed construction activity, the Project is not likely to cause significant adverse environmental effects to marine mammals.

"We did provide some data on the vessel traffic broadly on the project area and the numbers were in the order of 10,000 vessels per month, a whole variety of classes and others, anywhere between I think 20 and 28 ferries, depending on the season, plying these waters..." *(GSX PL, JRP Hearing Transcripts, 12 March 2003, Volume 13, Para 20925)*

The Panel is of the view that, in light of concerns about potential impacts of noise on marine mammals raised at the Marine Technical Conference and by various Intervenors, GSX PL should take all reasonable measures to construct the marine portion of the pipeline between October and April to minimize effects on marine mammals to the extent possible. Should construction extend beyond April, GSX PL should consult with regulatory agencies to develop any additional mitigation.

The Panel also expects that GSX PL would formulate a plan, as it committed to doing, to comply with the US "National Marine Fisheries Service, Northwest Region, Whale Watching Guidelines" and the "Be Whale Wise Guidelines for Watching Marine Wildlife" approved by the US and Canada as regional guidelines for the Salish Sea for vessel operation in proximity to marine mammals. This plan should be developed in consultation with DFO and include a requirement to record and report observations of marine mammals in proximity to construction vessels and to respond according to any additional DFO recommendations. Once finalized, the plan should form part of the Marine EPRP.

The Panel acknowledges that for marine mammal species in the southern Strait of Georgia, the resident killer whale population is endangered and the harbour porpoise population faces many environmental challenges. The Panel notes that these species inhabit an area that experiences high levels of commercial and recreational vessel traffic. The Panel also notes that studies by GSX PL suggest the operation of the pipeline would not introduce noise frequencies that would be detectable by killer whales or harbour porpoises. The Panel concludes that, if the proposed mitigation is implemented, including the Panel's recommendations, significant adverse effects to marine mammals are unlikely.

The Panel is also mindful of the need to ensure that the Project does not add cumulatively to the environmental challenges faced by these populations. Based on the pipeline design characteristics and results of acoustic modelling studies, the Panel concludes that it is unlikely that noise created during pipeline operations would add to the existing stresses on killer whales or harbour porpoises. As a result, the Panel is of the view that significant adverse cumulative environmental effects are unlikely. However, the Panel recommends that post-construction assessment of acoustic impacts from pipeline operation on killer whales and harbour porpoises be conducted. Should the results of post-construction assessment indicate that pipeline noise is detectable to killer whales and harbour porpoises, further mitigation measures should be developed.

Recommendation 8

The Panel recommends that GSX PL take all reasonable measures to construct the marine portion of the pipeline from October to April to minimize potential interactions with marine mammals. Should GSX PL determine that it is necessary for construction to extend beyond April, GSX PL shall file with the Board for approval at least 30 days prior to 30 April:

(a) information on the status of marine construction activities and an updated construction schedule, including the anticipated completion date;

(b) specific mitigation and monitoring plans that may be undertaken by GSX PL for construction activities outside the window; and

(c) copies of all correspondence and minutes of meetings demonstrating consultation in developing the plans with appropriate regulatory agencies, including Fisheries and Oceans Canada.

Recommendation 9

The Panel recommends that GSX PL file a report setting out the results of its post-construction sound emission study with the Board for approval within 90 days of commencement of operation of the pipeline. The report shall include data gathered on sound emitted from the marine pipeline for the representative range of flow, pressure, compressor operating conditions and any other factor that may contribute to the sound

emissions. Data should establish the level of sound emitted from the pipeline in relation to ambient noise levels and the distance this sound is propagated in the water column. Should the test results indicate that pipeline noise would be detectable to killer whales and harbour porpoises, GSX PL shall consult with Fisheries and Oceans and include in the report any additional mitigation measures it plans to implement to reduce the noise level.

4.4 Marine Protected Areas

The proposed pipeline route is not located within the boundaries of any existing Provincial Marine Parks, existing NMCAs, ecological reserves (ER), or Marine Protected Areas. However, the proposed route does traverse an Environmentally Sensitive Area (ESA) located along the pipeline landfall approach identified by the Cobble Hill Official Community Plan, a waterfowl wintering area at Boatswain Bank and Saanich Inlet Special Management Zone 16 (SMZ 16) identified in the Vancouver Island Land Use Plan and the Use, Recreation and Enjoyment of Public Reserve #1404485. In addition, the Project area includes or is in the vicinity of a number of existing regionally, provincially and federally protected or otherwise important marine areas. In particular, the proposed routing passes immediately north of the northern boundary of ER 67 at Cape Keppel, and the entire marine portion of the Project area is within the boundaries of a proposed NMCA.

There are several other notable marine conservation initiatives currently underway in the Project area. Provincially, nationally and internationally, government agencies from Canada and the US have recognized the Georgia Basin and Puget Sound ecosystems as forming part of a larger transboundary ecosystem and all are working together to ensure its sustainability through the Georgia Basin Ecosystem Initiative/Georgia Basin Action Plan and the Puget Sound/Georgia Basin International Task Force. The proposed Orca Pass Transborder Marine Stewardship Area Initiative, which encompasses Boundary Pass, is a citizens' group initiative with the objective of increasing public awareness of the state of marine resources and encouraging local action to protect and sustain them by designating a network of marine protected areas in the southern Strait of Georgia.

Issues raised by Intervenors with respect to existing and proposed marine protected areas located within the general Project area focused primarily on potential ecological effects on ER 67 and potential conflicts with the proposed NMCA in the Georgia Strait Marine Region. The Marine Coalition focused on potential effects to benthic communities from trenching activities in the vicinity of ER 67, and was critical of the consultation process carried out by GSX PL with federal agencies concerning plans for the NMCA. Parks Canada noted the potential hazards to NMCA visitors in the unlikely event of a pipeline rupture and recommended that the Panel ensure that all reasonable measures be taken by GSX PL to ensure maximum public safety.

The evaluation of routing options for the marine segment of the proposed pipeline was heavily influenced by the location of ER 67 in Satellite Channel. Under the current application, the northern boundary of ER 67 is located immediately south of the proposed pipeline route. In order to avoid entering ER 67, the pipeline has been routed north of ER 67 in the steep foreshore between the reserve boundary and Saltspring Island. After evaluating a number of possible routing alternatives, GSX PL concluded that, from a technical perspective, routes going through ER 67 were preferable. A follow-up environmental study commissioned by GSX PL concluded that slightly less ecological damage and habitat modification would result if the pipeline were routed through the more level areas of ER 67. DFO and local First Nations have also indicated that, for a number of environmental and cultural reasons, the ER 67 routing option should be fully considered. However, in recognition of the BC *Ecological Reserve Act*, the current application before the Panel proposes that the

pipeline be routed north of ER 67 in the steep foreshore between the reserve boundary and Saltspring Island.

BC Parks commissioned an independent environmental evaluation of the various routing options in an effort to clarify the issue of routing through ER 67. The evaluation concluded that, while there is still much to be learned regarding the soft substrate communities of ER 67 and the potential effects of the pipeline, overall environmental effects of a pipeline route through ER 67 may be marginally less than the route that was applied for. The results of this study were intended to assist BC Parks in formulating a provincial position on this issue. The BC government has indicated that it would not respond to this issue until there is a NEB Act and CEA Act ruling on the overall Project application. Depending on the final position of BC Parks, GSX PL has indicated that it may in the future apply to the NEB for approval of an alternate route through ER 67.

GSX PL discussed the Project and the proposed pipeline routing with representatives from Parks Canada who indicated that the pipeline was not incompatible with the zoning that would most likely be introduced for the proposed NMCA. Furthermore, since planning for the proposed NMCA is currently at the feasibility stage and decisions concerning boundaries and regulatory framework will, most likely, not be made for a considerable length of time, GSX PL is proceeding with its application.

The Panel notes that the current application before it proposes that the pipeline be routed north of ER 67 in the steep foreshore between the reserve boundary and Saltspring Island and does not include the option of routing through ER 67. In the absence of an application for the alternative route through ER 67, the Panel refrains from making a judgement on the relative merits of the two routes. However, the Panel concludes that, with the implementation of the proposed mitigation measures, the environmental effects of routing north of ER 67 are not likely to be significant.

Environmental Reserve 67

Ecological reserves (ER) are areas selected to preserve representative and special natural ecosystems, plant and animal species, and features and phenomena in BC. Scientific research and educational purposes are the principal uses of ecological reserves. Ecological reserves are established for the: (1) preservation of representative examples of British Columbia's ecosystems; (2) protection of rare and endangered plants and animals in their natural habitat; (3) preservation of unique, rare or outstanding botanical, zoological or geological phenomena; (4) perpetuation of important genetic resources; and (5) scientific research and educational uses associated with the natural environment.

Ecological reserves are established under the *Ecological Reserve Act*, which was passed by the BC government in 1971. The Ministry of Water, Land and Air Protection is responsible for the management and protection of ecological reserves. All consumptive resource uses, such as tree cutting, hunting, fishing, mining, domestic grazing, camping, lighting of fires and removing materials, plants or animals, and the use of motorized vehicles are prohibited in ecological reserves. It is important to note that the ER designation applies only to the seafloor and not the water column above.

Satellite Channel ER 67, located between Saltspring Island and the Saanich Peninsula, was designated in 1975 to conserve rich benthic (bottom-dwelling) communities typical of fine-grained, level-bottom environments in the southern Gulf Islands. ER 67 covers much of the width of Satellite Channel and measures one square nautical mile or 343 ha in area. Water depths in most of the reserve range from 55 to 80 m, with the shallowest areas of about 18 m being located in the southwest corner of the reserve. At the time of designation, 67 marine species had been identified, including diverse mollusc, marine worm, and sea star populations.

National Marine Conservation Areas

National Marine Conservation Areas are being established to protect and conserve a network of representative areas of the vast diversity of marine environments in Canada's Atlantic, Pacific and Arctic oceans and the Great Lakes. The coastal waters of Canada have been subdivided into 29 marine regions, and the intent is to establish one National Marine Conservation Area in each of these regions, thereby representing the diversity of these regions in a national system. National Marine Conservation Areas are established for the benefit, education and enjoyment of the people of Canada and the world, and will be managed to demonstrate how protection and conservation practices can be harmonized with the sustainable use of marine ecosystems. National Marine Conservation Areas are managed by Parks Canada under the *Canada National Marine Conservation Areas Act* and are protected from such activities as ocean dumping, undersea mining, and oil and gas exploration and development. Traditional fishing activities will be permitted, but managed with conservation of the ecosystem as the main goal.

In 1998 the Federal Government announced a feasibility study for a National Marine Conservation Area in the southern Strait of Georgia. Ongoing feasibility study activities involve close collaboration between all levels of government, local communities, regional stakeholders and Aboriginal peoples. A broad representative area has been tentatively identified for the feasibility study, which includes the waters surrounding the southern Gulf Islands and Saanich Inlet. Within the larger study area there may be a number of ecologically important core areas that would be studied more intensively. Among the natural attributes of the feasibility project area are complex oceanographic patterns and richly varied fish, marine invertebrate and marine mammal populations.[4]

[4] The Panel notes that subsequent to the close of the hearing, on 9 May 2003 the Honourable Sheila Copps, Minister of Canadian Heritage, and the Honourable David Anderson, Minister of the Environment, along with the Honourable Joyce Murray, B.C. Minister of Water, Land and Air Protection, and the Honourable Murray Coell, B.C. Minister of Human Resources and MLA for Saanich North and the Islands, formally established Gulf Islands National Park Reserve of Canada as the nation's 40th national park. The Gulf Islands National Park Reserve of Canada is the first new national park established under the Government of Canada's Action Plan to create ten new national parks and five marine conservations areas in the next five years. This new national park reserve will protect one of Canada's most biologically diverse and endangered natural regions, with a total area of approximately 26 km^2 in the southern Strait of Georgia, spread out over 29 sites on 15 islands including over 30 islets and reefs. (Parks Canada Agency News Release and Backgrounder, 9 May 2003)

5. Effects On Terrestrial Valued Ecosystem Components

5.1 Ground and Surface Water

5.1.1 Changes in Water Quality

GSX PL submitted that substantial, deliberate and incidental alteration of natural flow patterns as a result of ditching, draining and recontouring of the land for agricultural activities has already occurred in much of the Project area. All watersheds within the local and regional cumulative effects study areas have been substantially modified. The Project would add incrementally to those effects, although this would be limited primarily to the initial construction phase and tend to revert to background conditions following construction. GSX PL also stated that, with proper implementation of the mitigation measures proposed, disruption to surface flow patterns is likely to be minor. In the event that flooding of fields or changes in surface water regimes do result, corrective action in consultation with the landowner would be undertaken to adequately resolve the issue.

Specific concerns regarding the potential for alteration of surface water and groundwater quality were expressed by Intervenors. One area of concern was the proximity of the pipeline route to the Cowichan Valley Regional District's Shawnigan Beach Estates sewage ground exfiltration system. The pipeline route passes within about 70 m of the downslope area of this system. GSX PL submitted that since the proposed route is outside of the sewage disposal area, and any effluent would have undergone some level of natural filtration by the time it reaches the trench, it would be unlikely that outflow at this location would contain sewage effluent. However, GSX PL would install impervious trench plugs on either side of a low spot and pump any contaminated groundwater from the low spots in the trench to the sewage lagoon immediately to the west of the pipeline route. GSX PL stated that it would maintain close inspection of construction in this section to ensure that the construction plan developed by the contractor is implemented and that potentially contaminated groundwater is discharged as required.

During certain phases of construction, contaminated water could accumulate in the

open trench, either from groundwater intrusion or precipitation. GSX PL indicated that the trench would be de-watered periodically, as necessary, to prevent sedimentation and facilitate construction. During trench de-watering, water would be pumped from the trench onto vegetated areas to prevent sediment-laden water from flowing directly into any waterbody or wetland. GSX PL indicated that, where necessary, water from the trench would be discharged through a de-watering structure such as a filter bag or hay bale enclosure. GSX PL also indicated that it would implement mitigation measures to ensure that surface contaminants would be kept out of the trenches during construction. GSX PL stated that construction-related solid, industrial, and liquid waste would be managed to avoid effects to water quality. Solid waste is non-toxic in nature and includes things such as: office and lunchroom wastes; spent welding rods; survey stakes and flagging tape. Industrial waste may contain quantities of potentially toxic substances in the form of residues. Industrial waste includes things such as: used lube filters; spent grease cartridges; radioactive waste; and film processing chemicals. Liquid waste includes things such as: fuels; lubricants; coolants; sewage and paint. Management practices GSX PL has committed to include: following local, provincial and federal legislation for disposal of waste materials; storing fuel, oil and hazardous substances at least 100 m from a watercourse or waterbody; storing hazardous materials in a bermed area or in double walled tanks; and providing portable domestic sewage facilities and vacuum truck services where feasible.

GSX PL committed to implement industry-standard mitigation measures, such as runoff control during and immediately after construction (e.g., silt fences), a revegetation program for the streambanks, soil compaction relief, terrain contour restoration and installation of cross ditches, diversion berms, trench breakers and subdrains, where appropriate, to reduce interference with surface and groundwater.

The Panel accepts the mitigation measures proposed by GSX PL to reduce the risk of alterations to the surface and groundwater quality, but due to the very close proximity of the Cowichan Valley Regional District's Shawnigan Beach Estates sewage ground exfiltration system, the Panel remains concerned about the possibility of sewage contaminants entering the aquifers through the movement of groundwater into the trench. Therefore, the Panel recommends that GSX PL be required to have in place, prior to construction, a monitoring plan that would provide information on the condition of the groundwater in the pipeline trench.

The Panel concludes that, with the implementation of the proposed mitigation measures and the Panel's recommendation, significant adverse effects to water quality are unlikely.

Recommendation 10

The Panel recommends that GSX PL file for approval with the Board, at least 60 days prior to the commencement of clearing of vegetation or ground-breaking activities, a report outlining the plan to test groundwater encountered during excavation for sewage constituents. The report shall:

(a) include a statement of the type of testing methodology to be used;

(b) indicate the sewage constituents to be tested for;

(c) include the acceptable levels of each constituent;

(d) provide the frequency of testing; and

(e) provide a mitigation and disposal plan for water found to exceed the acceptable limits.

5.1.2 Changes in Groundwater Flow

The construction process for the HDD requires a fresh water supply during the drilling operation. Braithwaite Estates raised a concern with the environmental soundness of withdrawing the water from the aquifer.

"I wonder if you could just explain again how you will determine whether or not – if it is okay to withdraw that quantity of water from the aquifer and how this will be brought into this approval process to ensure that it is, in fact, an environmentally sound thing to be doing." *(Braithwaite Estates, JRP Hearing Transcript, 5 March 2003, Volume 8, Para 14204)*

GSX PL stated that it has approached the Granville Estate to investigate whether or not it would be possible to make a compensatory arrangement with the farmers (i.e., arrange for Granville Estate to not irrigate during that 21 day construction period for the HDD) which would allow GSX PL to withdraw the necessary water with minimal impact to the aquifer. In the event an agreement is not reached, GSX PL stated it would install a temporary well or wells near the HDD site. GSX PL stated it would ensure the elimination of any residual impact on existing water withdrawals from the aquifer. There are four wells within 100 m of the HDD drill path. As GSX PL would be creating a possible drainage path for groundwater along the drill path, GSX PL stated it would monitor the condition of these wells in relation to the HDD construction.

Braithwaite Estates also expressed concerns about the permeability of the backfill and possible effects to local aquifers. GSX PL stated it would backfill the trench with material excavated from the trench and compact it to a density similar to pre-construction to ensure that the permeability of the backfill is similar to that of the adjacent undisturbed native soils and that the trench does not act as a conduit for entry of water into the aquifer below. Furthermore, GSX PL stated that it could undertake permeability tests on the backfilled trench to check if the compaction is resulting in permeability similar to the surrounding soils.

The Panel notes the concerns expressed by Braithwaite Estates and GSX PL's response to those concerns. The Panel wishes to ensure that monitoring is done in the vicinity of the HDD such that there is no detrimental effect on the yield and water quality of the nearby wells. The Panel encourages GSX PL to discuss these monitoring plans with Braithwaite Estates in advance of submitting the plans to the NEB. Furthermore, the Panel is of the view that permeability testing of the compacted backfill material should be carried out. The Panel concludes that, with the implementation of the proposed mitigation measures and the Panel's recommendations, significant adverse effects to groundwater flow are unlikely.

Recommendation 11

The Panel recommends that GSX PL file for approval with the Board, at least 60 days prior to the commencement of clearing of vegetation or ground-breaking activities, a report outlining the plan to test wells 18200, 27402, 28298, and 29881 for yield and water quality prior to, during and after the HDD construction. The report shall:

(a) include a statement of the type of testing methodology to be used;

(b) include the acceptable water quality level and well yield;

(c) provide the frequency of testing;

(d) include the duration of testing after the HDD construction; and

(e) provide for any additional mitigative measures that would be implemented.

Recommendation 12

The Panel recommends that GSX PL file for approval with the Board, at least 60 days prior to the commencement of clearing of vegetation or ground-breaking activities, a report outlining a testing plan to ensure that, upon backfilling and compaction, trench backfill material has permeability properties consistent with the surrounding soils. The report shall:

(a) include pre-construction in-situ field testing;

(b) include the infiltration test procedure to be used;

(c) provide the criteria for determination of acceptable permeability range limits relative to existing conditions;

(d) provide the frequency of testing; and

(e) include a mitigation plan if permeability is found to be outside acceptable limits.

5.1.3 Changes in Surface Water Flow

GSX PL stated that surface water resources in the Project area are licensed and used to near capacity. Diversion of surface water could affect downstream users. Instream activity in watercourses that have water intakes downstream of construction can raise the suspended sediment load to a level where the water quality is not suitable for the purpose intended. Construction can disrupt drainage systems in agricultural fields unless the tiles and ditches are properly crossed, the existing infrastructure restored and provided the pipe has an adequate burial depth.

In response to intervenor concerns, GSX PL stated that depth of pipe burial was established to minimize interference with present and likely future tile drainage systems. Furthermore, GSX PL stated it had identified potentially affected water license holders in the study area and would contact them prior to construction to develop appropriate mitigation measures. GSX PL concluded that a slight short-term inconvenience to some licensed surface water users is likely to be the only effect. The Panel encourages GSX PL to discuss these short-term inconveniences with licence holders in the area and develop mutually agreeable solutions.

The Panel concludes that any potential adverse environmental effects associated with changes in surface water flow would be effectively mitigated with the proposed depth of pipe burial and the implementation of other mitigation measures including notification of water license holders. The Panel concludes that significant adverse effects to surface water flow are unlikely.

5.1.4 Effects of Blasting on Water Resources

The potential for blasting to disrupt aquifers and nearby water well flow rates was an issue of concern for several Intervenors. GSX PL stated that all measures for excavating bedrock would be considered before the commencement of blasting. Furthermore, all blasting procedures and agents used would be in accordance with federal and provincial guidelines and no pre- or post-blast residue is likely to remain below ground surface. GSX PL also committed to monitoring, before and after blasting, all registered or known water wells within 300 m of any blasting site. While GSX PL considered the probability of Project effects on water wells to be relatively low, it committed to discuss with the well owner any changes in water quality and flow rates that correlate to GSX PL's blasting activities. Compensation in the form of drilling a new well or remediating the existing well may be required if damage to water quality or flow is detected. Finally, GSX PL concluded that, given the remoteness of areas where bedrock might occur along the route, it is unlikely that any effects on human health would result from blasting.

The Panel wishes to ensure that GSX PL monitors nearby wells, responds to any complaints it receives, and that the NEB is informed of the status of the resolution of any complaints. The Panel considers it is in the interests of landowners to allow GSX PL to perform the proper pre-construction analysis of water wells to allow for an adequate characterization of pre-construction conditions to compare with the post-construction assessments. The Panel notes a possible benefit of pre-construction well analysis is that current water quality parameters, including yields and the presence of any contaminants, would be known to landowners.

The Panel concludes that, with the implementation of the proposed mitigation measures, GSX PL's commitments

to landowners as well as the Panel's recommendation, significant adverse effects of blasting on water resources are unlikely.

Recommendation 13

The Panel recommends that GSX PL offer to conduct, for those landowners with wells located within 50 m of the pipeline ROW and within 300 m of blasting activities, detailed pre-construction water well analyses to acquire baseline information about water quality and well function including yield. Following completion of construction activities, GSX PL shall offer to conduct additional water well monitoring and analyses, for those landowners who agreed to pre-construction analyses, to confirm no adverse effects. If the analyses demonstrate an effect (deterioration in water quality or well yield) on a specific water well due to GSX PL's activities it shall undertake corrective action to address any effects. GSX PL shall document and respond to any complaints received concerning water quality or well function for two years following construction. GSX PL shall file with the Board within 14 days of receiving the complaint, a summary of the issue and a discussion of its resolution, or a proposed action plan.

5.2 Fish and Riparian Habitat

Potential effects on fish and riparian habitat include: alteration or destruction of habitat; elevated turbidity and sediment deposition; disruption of flows; and injury and mortality.

The Project would cross eight watercourses, which are considered small by regional standards with at least one-half being ephemeral. The presence of fish was confirmed by GSX PL in only three of these watercourses. No fall spawning species were present in any watercourses along the ROW.

GSX PL indicated that de-watering of a fish-bearing watercourse during construction could lead to loss of fish and invertebrates. To address this concern, GSX PL would adhere to the approved construction window of 15 July to 15 September for watercourses that support fish species. If flow is present in any watercourse, GSX PL committed to using isolated crossing techniques (e.g., dam and pump) to ensure continuous flow. If de-watering of an isolated area was necessary, fish salvage would be undertaken. If blasting was required in-stream or in close proximity to streams, GSX PL would comply with DFO requirements for blasting in fish-bearing watercourses. All vehicle crossing structures would be removed after construction, and the streambanks, large woody debris and overhanging vegetation would be restored. Further, GSX PL considered the Canadian Pipeline Watercourse Crossing Committee 1999 document titled "Watercourse Crossings, 2nd Edition", and would follow its recommendations for mitigation. GSX PL stated invertebrate populations would begin to repopulate the area of disturbance in a few days as a result of benthic drift, with overall recovery anticipated within one year. GSX PL also stated that amphibians present in wetland ponds that would be traversed or encroached on at the time of construction would be relocated to adjacent vegetation areas or wetlands.

DFO noted that it would likely provide a *Fisheries Act* Section 35(2) authorization for those watercourse crossings that would result in harmful alteration, disruption or destruction of fish habitat (HADD), following the issuance of any NEB Certificate.

The Panel accepts GSX PL's proposed approach to stream crossings and the mitigation measures it has adopted. With the implementation of proposed mitigation measures, the Panel concludes that significant adverse effects to fish and riparian habitat are unlikely.

5.3 Physiography and Soils

Potential effects of the Project related to blasting, terrain stability, changes in soil structures, and wind erosion were identified.

GSX PL estimated that bedrock occurs at the surface or beneath a soil cover less than 2 m thick over about 15 per cent of the pipeline corridor length, based on a limited geotechnical investigation. To ensure a sufficient burial depth, the rock would be ripped and in some cases blasted. Blasting could cause fly rock, vibration resulting in structural damage to nearby buildings and disruption of groundwater (section 5.1.4). Excavated rock could result in excess displaced rock, which would have to be disposed of in a manner that does not adversely affect the agricultural or other uses of the land.

GSX PL stated that bedrock would be ripped wherever feasible to minimize the amount of blasting. Furthermore, the trench depth would be reduced to provide a 0.6 m depth of cover to reduce the need for blasting while still providing adequate cover to ensure pipeline integrity. Blasting mats would be used where inhabited structures are within 50 m of blasting to control fly rock. Blasting controls, such as limits on individual blasts, use of delays and buffer blasting would be implemented within 50 m of any structure that could sustain damage from ground vibration. Where blasting occurs within 20 m of inhabited structures, ground vibrations during blasting would be monitored. Excess blast rock and excavated rock that remains following backfill would be disposed of in consultation with the landowner and municipality.

GSX PL stated it would conduct a pre-construction assessment of inhabited structures within 50 m of blasting activity. However, the Panel wishes to ensure that GSX PL monitors nearby structures, responds to any complaints it receives, and that the NEB is informed of the status towards resolution of any complaints. Therefore the Panel recommends that GSX PL conduct a detailed and structured pre- and post-construction assessment of inhabited structures within 50 m of the pipeline ROW where blasting occurs. The Panel considers it in the interests of landowners to allow GSX PL to perform the proper pre-construction analysis of inhabited structures to adequately characterize pre-construction conditions for comparison with post-construction structural assessments.

Recommendation 14

The Panel recommends that GSX PL offer to conduct, for those landowners with inhabited structures within 50 m of the pipeline ROW, detailed pre-blast structural assessments. Following construction, GSX PL shall offer to conduct post-blast structural assessments, for those landowners who agreed to pre-blast structural assessments. If the assessments demonstrate an effect on a specific inhabited structure due to GSX PL's activities, it shall undertake corrective action to address any effects. GSX PL shall document and respond to any complaints received concerning blasting effects on inhabited structures for two years following construction. GSX PL shall file with the Board within 14 days of receiving the complaint, a summary of the issue and a discussion of its resolution, or a proposed action plan.

Terrain stability is primarily a concern in the Cobble Hill area and at the coastal bluff at Manley Creek. For these areas, GSX PL has identified a number of mitigation measures in its EPRP to control erosion. At Manley Creek, erosion control would be necessary only if the HDD fails and a partial HDD or full open cut of the bluff is required.

Potential effects to soils identified by GSX PL include: topsoil loss; mixing of topsoil with subsoil; topsoil pulverization; erosion, compaction and rutting; altered soil quality; contamination; increased stoniness; and altered soil drainage. Soils in the Project area may be susceptible to wind erosion when dried or pulverized during construction, creating fugitive dust. Should effects to soils occur, this in turn could affect the re-establishment

of vegetation and agricultural production. For each potential effect to soils, GSX PL identified industry standard mitigation measures. GSX PL submitted that any adverse effect would be limited to the periods of heavy activity during construction as well as over the short-term until vegetation becomes re-established on the ROW. Furthermore, GSX PL submitted that pipeline construction would result in short-term loss in agricultural land capability. GSX PL committed to conduct a detailed soil survey on lands that were not inventoried and obtain information on the thickness and depth of soil layers and reconfirm the classification of soils along the proposed route.

During GSX PL's consultation with the Vancouver Island Pipeline Landowners Association (VIPLA), concerns were raised over agricultural issues including soils and drainage. GSX PL concluded an agreement with VIPLA and updated its Terrestrial EPRP and filed it with the Panel to reflect its commitments related to agricultural issues.

The Panel concludes that the industry standard mitigation measures proposed by GSX PL are appropriate for the route. While the mitigation measures are generally satisfactory to the Panel, the Panel is of the view that some discretion for erosion control and soil protection should be left to GSX PL field staff because of site-specific conditions. However, given the importance of soils as an agricultural resource and as a medium for subsequent vegetation growth, the Panel concludes that it is necessary to have qualified environmental inspection staff and a soil specialist with authority to make decisions in the field available to GSX PL's contractors.

The Panel concludes that, with the implementation of proposed mitigation measures and recommendations of the Panel, significant adverse effects from blasting to structures and from construction activity on soils and agricultural productivity are unlikely.

Recommendation 15

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of construction (which for the terrestrial portion of the pipeline means clearing of vegetation or ground-breaking activities and for the marine portion of the pipeline means the initiation of pipe lay operations) or within a time otherwise directed by the Board, the qualifications and experience of the Environmental Inspectors and Soil Specialist(s) who will be used on the Project.

5.4 Air Quality

5.4.1 Local and Regional Air Quality

Pipeline construction emissions from heavy equipment, service vehicles, welding activities, lay barge, auxiliary equipment, and support vessels have the potential to affect air quality. During operation and maintenance, emissions would be associated with vehicle and vessel traffic for scheduled pipeline inspection, repairs, and maintenance such as ROV surveys, span rectification, upgrade and repair procedures. In the unlikely event of a system blowdown during operations, up to 0.7 million m^3 (25 MMscf) of gas could be released.

The primary spatial boundary for the air quality assessment of the Project was the regional study area. Qualitative information on categories of other contaminant emission sources in the local and regional study areas was provided to give a perspective on cumulative emissions. Construction and operation related emissions would add cumulatively to other emission sources, so Project emissions were juxtaposed with an estimate of contaminant emissions from Vancouver Island. Other emission sources include passenger vehicles, vessel traffic, logging and wood processing operations, other non-specific residential, commercial and public construction projects, wood burning, and agricultural emissions. GSX PL submitted that it is not aware of any air quality monitoring stations within the local or regional study area,

nor were there any indications of air quality parameters being routinely exceeded within the study boundaries. Precise modelling of long-term ecological and health-related aspects of these emissions was considered by GSX PL as being beyond the reasonable scope of the assessment for the Project.

To minimize emissions, GSX PL would ensure that all vehicles and equipment are maintained in good working order and properly sized for the job. Crew buses would be used where appropriate and unnecessary vehicle idling would not be permitted. Construction scheduling would strive for an efficient mobilization of equipment and task completion. Prior to planned blowdowns, the line would be isolated and drawn down to reduce release volumes.

Early in the process, the Panel was requested to include in its review the environmental effects of emissions resulting from the combustion of the gas that would be transported by the Project. It was also argued that the environmental effects of the combustion of gas would act cumulatively with emissions from the Project. As noted earlier, the gas proposed to be transported by the Project would be burned at the two generation facilities, ICP and VIGP.

In its 31 May 2002 Decision, the Panel determined that consideration of the environmental effects of the combustion of the gas at the proposed VIGP is relevant to its determination under the NEB Act. A discussion of the evidence and potential effects of VIGP would be included in the Panel's Reasons for Decision, if a certificate were to be issued. The Panel found that the generation facility was not included in the scope of the Project to be assessed under the CEA Act and therefore it would not consider the environmental effects of combustion of the gas at VIGP in this Report. However, the Panel made no determination, at that time, as to whether the environmental effects of the proposed pipeline would act cumulatively with the environmental effects of the combustion of some or all of the gas to be transported.

The question of possible consideration of those effects as part of the consideration of cumulative effects was left to be determined during the hearing process.

GSX PL submitted information to the Panel on the proposed VIGP. This information was excerpted from the "Application for a Project Approval Certificate" submitted by Vancouver Island Energy Corporation (VIEC) to the British Columbia Environmental Assessment Office on 17 June 2002. The proposed VIGP power plant would have a nominal power output of 265 MW without duct firing and 295 MW with duct firing.

The Panel examined the potential environmental and cumulative effects of Project emissions on air quality. The Panel notes that emissions, other than GHGs, from the Project would be outside the respective airsheds where VIGP and ICP would be located, and as such would not act cumulatively with ground-level concentrations locally or at the regional level to affect air quality. The Panel concludes that any air-quality effects resulting from the Project would be minimal, temporary and infrequent, and as such significant adverse effects would be unlikely. Given the minimal Project-related emissions and their short-term nature, the Panel concludes that any residual emissions that could combine with emissions from other projects and activities to act cumulatively with ground-level concentrations, locally or at the regional level, would be negligible and not likely to be significant.

5.4.2 Greenhouse Gases

To evaluate GHG emissions, GSX PL provided a projected comparison of nitrous oxides, carbon monoxide, and volatile organic compounds from the Project to 1995 totals for Vancouver Island. Project emissions would be much less than 1 per cent of the 1995 totals. During operation, a blowdown could release up to 0.7 million m^3 of gas. SPEC/DSF submitted that the pipeline would produce a total of 11,526 tonnes of CO_2- equivalent emissions during construction.

GSX PL's cumulative effects assessment for GHG did not identify and, therefore, did not consider any single point sources generated by other projects or activities in the study area. GSX PL considered cumulative GHG Project emissions from construction and operation to be minimal and non-significant in light of other regional and global emission sources. However, GSX PL stated it would participate in the Voluntary Challenge & Registry Inc. (VCR Inc.) program as a means to assist in tracking and reducing GHG emissions from its pipeline system.

SPEC/DSF provided written evidence related to effects of GHG and global climate change referring to the Intergovernmental Panel on Climate Change and Canada's ratification of the Kyoto Protocol to the United Nations Framework Convention on Climate Change. In relation to GHG, several Intervenors, including SPEC/DSF and GSXCCC, argued that the combustion of all of the gas carried by the pipeline should be considered within the scope of the cumulative effects assessment. SPEC/DSF submitted that GHG emissions from the combustion of the gas to be transported by the Project would more than double BC Hydro's total GHG emissions for 2001 and would constitute a major new GHG source in BC. Climate change effects of burning the gas to be transported by the Project were considered by these Intervenors to be significant adverse environmental effects inseparable from the construction and operation of the pipeline itself.

The Panel considers climate change an important Canadian and global issue and recognizes the Government of Canada's effort in this regard by the ratification of the Kyoto Protocol and the development of the Climate Change Plan for Canada.

In relation to GHG emissions, specific GHG species (e.g., nitrous oxide) may affect local ambient air quality related to properties of those species, but effects of GHG emissions, such as climate change, are observed on a regional and global scale. Although the GHG emissions from the proposed pipeline are very minor in comparison to overall emissions on Vancouver Island, they will contribute to climate change by combining and interacting with emissions from other present and future emission sources around the world. At such a global scale, any change in climate or the environment caused by GHG emissions from the Project could not be defined, measured or described. The Panel also notes that, at the present time, there are no defined criteria to measure significance in relation to GHG when considered in a cumulative environmental effects assessment.

Rather than specifically attempt to assess changes in climate or the environment resulting from measurable Project-specific GHG emissions, the Panel found it more useful to take GHG emissions into consideration in the environmental assessment by comparing potential Project emissions to provincial and federal GHG emissions. In comparison to GHG totals of 65.9 mega tonnes (MT) and 726 MT of CO_2 equivalent in 2000 for BC and Canada respectively, as submitted by SPEC/DSF, the Panel concludes that the Project would represent an approximate increase of 0.02 per cent over the BC total, and much less for Canada as a whole.

In relation to GHG, Environment Canada indicated that Parliament ratified the Kyoto Protocol on 17 December 2002, and is now moving from a planning phase to one of implementing the Climate Change Plan to achieve the national GHG reduction targets. Reporting of GHG through either the National Pollutant Release Inventory (NPRI) or some other mechanism will begin in 2004. The mechanism is to be mandatory, verifiable and contain suitable provisions for facility-level reporting. The Government of Canada is to consult stakeholders on the reporting mechanism within the context of discussion on climate change.

Regarding the Kyoto Protocol, the Panel relied on Environment Canada's statement:

> "The Climate Change Plan for Canada aims to achieve our national GHG

reduction target of 6% below 1990 levels, or 240 MT. This target takes into account projections that incorporate reasonably large increases in both natural gas consumption and electricity consumption in BC. Most of the latter is projected to come from gas-fired generation. Consequently, emissions resulting from new natural gas pipeline and energy generation projects have been factored into the outlook. Because such developments have been incorporated in the outlook, the GSX project should not compromise Canada's ability to reach our Kyoto target." [4]

The Climate Change Plan for Canada, as referred to by Environment Canada, indicates that although no final targets have yet been determined, there are ongoing discussions with industry representatives on the role each sector will play in contributing to Canada's Kyoto objectives. The Panel notes that the implementation of Kyoto is in its infancy and there is some uncertainty how it will be implemented in Canada.

The Panel also notes that, at the present time, there are no defined criteria to measure significance in relation to GHG when considered in an environmental assessment. The federal and provincial governments are in the process of developing further policies to ensure the management of GHG through targets and regulations that could affect specific industrial developments such as the Project. Had there been detailed policies or regulations for targets in place, the Panel could have evaluated GHG emissions against these.

The Panel is of the view that GSX PL has adequately considered the potential GHG emissions from the Project. In light of comments from Environment Canada regarding Canada's ability to reach its Kyoto target, and GSX PL's commitment to participate in the VCR Inc. program, the Panel concludes that the GHG emissions from the Project are unlikely to result in significant adverse environmental or cumulative effects as a result of GHG emissions.

5.5 Vegetation

Clearing of vegetation and topsoil stripping of the ROW would result in some loss, alteration and fragmentation of natural vegetation, and rare and sensitive plant communities. Introduction of weed species along the ROW was also identified as a concern by landowners.

5.5.1 Alteration of Native Vegetation

Relatively intact forested areas in the vicinity of the Project area are acquiring structural features associated with old-growth forests. These features include a diversity of tree species and sizes, large pieces of standing dead or diseased trees (wildlife trees), downed dead wood (coarse woody debris) and a range of canopy closures and layers. Forested and other lands along the proposed route provide habitat for many wildlife species. GSX PL submitted that a small portion, approximately 0.5 hectare (ha), of the proposed ROW would affect older growth, or vegetation greater than 200 years old, with more than two canopy layers. Additionally about 3 ha of mature forest would also be affected. In comparison, the entire footprint of the ROW is approximately 43 ha.

Environment Canada submitted that re-routing around contiguous habitats is the preferred approach to mitigate habitat removal and fragmentation. Where rerouting cannot be achieved, Environment Canada expected a solid rationale and options for on and off-site habitat compensation.

GSX PL attempted to avoid sensitive species and communities to the extent feasible in routing the pipeline ROW. GSX PL indicated that the avoidance of significant communities such as old growth forests was an integral component in the routing strategy but complete avoidance was not possible. GSX PL believes that its selected route would cause the least

[4] Environment Canada letter dated Feb. 2003, p. 5.

possible fragmentation of older forest habitat. For example, a substantial route modification was undertaken to avoid an extensive, relatively intact woodland segment on Cobble Hill. Furthermore, GSX PL noted that none of the old growth forest along the pipeline route, on private or Crown land, is protected, and several forested areas traversed by GSX PL have been logged since they were first examined by GSX PL and others are scheduled for logging. GSX PL relied on avoidance and ROW narrowing, wherever possible, in order to minimize effects to rare plants and wildlife trees. GSX PL submitted that, given the route selection process that has been undertaken, combined with the proposed mitigation measures, it has taken Environment Canada's concern into consideration and reduced adverse effects to forest habitats.

Preliminary weed surveys were carried out, but GSX PL committed to conduct a further weed survey of the entire ROW to identify and record weed occurrences on agricultural lands pre- and post-construction, and identified standard agricultural weed control measures such as using weed free seed mixes and strawbales to prevent importation and distribution of weeds along the ROW.

With respect to reclamation of the ROW, the Panel notes that GSX PL consulted with relevant government agencies to develop appropriate seed mixes and that GSX PL proposes to use native shrubs in certain locations. The Panel encourages the use of native species during the reclamation process in natural areas, to the extent feasible. GSX PL has committed to not seeding wetlands, and has proposed to re-plant temporary work spaces with coniferous seedlings. Criteria for planting shrub bands as visual screens along selected areas of the ROW were provided.

The Panel is of the view that GSX PL has taken an appropriate approach to addressing the issue of alteration of native vegetation. Although some changes to existing vegetation will occur, with mitigation measures such as route selection and avoidance of older growth vegetation to the extent practical, the Panel concludes that significant adverse effects to native vegetation communities are unlikely.

5.5.2 Rare Plant Species

GSX PL indicated that clearing, topsoil stripping and general ROW traffic have the potential to impact rare plants or populations of rare plants. Furthermore, a change in the microclimate (i.e., light exposure, moisture regime, and other soil characteristics) can indirectly affect the viability of a plant adjacent to the ROW, even if it has not been directly affected by construction.

Three known species of rare plants occur within the ROW and will be affected by construction and by direct removal. These species include slender woolly heads, snow-white rein orchid and California-tea. Four additional rare species have a high potential to exist within 50 m of the ROW (chaffweed, brook spike-primrose, mountain sneezeweed, mousetail) but they were not identified during vegetation surveys. Snow-white rein orchid and slender woolly heads are red-listed in BC, meaning they are imperiled due to extreme rarity or because of a factor making them vulnerable to extinction. California-tea is a blue-listed species provincially and is considered vulnerable due to its rarity or because it is vulnerable to extinction.

GSX PL submitted that slender woolly heads and California-tea populations would likely experience minimal effects and may even experience beneficial effects from the Project due to their preference for forest openings and disturbed areas. However, six specimens of snow-white rein orchid may be lost if mitigation is not successful. Mitigation includes options such as narrowing the ROW or slightly adjusting the alignment. Where this is not feasible, plants will be salvaged and transplanted to similar habitat away from the ROW. GSX PL indicated that it was unaware of any previously documented attempts at transplanting snow-white rein orchid.

GSX PL committed to conducting an additional rare plant survey to identify the potential for missed rare plant locations, in particular brook spike-primrose, and other high potential occurrences. Protection measures for snow-white rein orchid and other rare plants discovered during pre-construction surveys would be based on site-specific conditions once the final route refinements and boundary staking have occurred. GSX PL's environmental inspector, in consultation with botanical experts and the appropriate government agencies, would make final decisions on mitigation measures.

The Panel concludes that a pre-construction survey along the ROW should be undertaken and the results and proposed mitigation filed with the NEB. With respect to the three listed plant species of concern, although it is unlikely that the plant species would be significantly adversely affected, there is no persuasive evidence on the record to suggest that GSX PL's proposed mitigation is proven for these species in this ecosystem. Therefore, the Panel recommends that a follow-up program should be required to verify the accuracy of the environmental assessment predictions and to assess the effectiveness of the mitigation for the three listed plant species of concern and any other rare plants discovered during the pre-construction surveys.

Recommendation 16

The Panel recommends that GSX PL file with the Board, at least 21 days prior to the commencement of clearing of vegetation or ground-breaking activities, the methodology and results of a pre-construction survey for federally and provincially listed plant species of concern along the entire terrestrial portion of the ROW. Where plant species of concern could be affected by construction activities, GSX PL shall also file a detailed mitigation plan for approval, including copies of all correspondence and minutes of meetings demonstrating consultation in developing the plan with appropriate regulatory agencies, including Environment Canada.

Recommendation 17

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of clearing of vegetation or ground-breaking activities, a follow-up program to verify the accuracy of the environmental assessment predictions and to assess the effectiveness of the mitigation developed for snow-white rein orchid, slender woolly heads, California-tea, and any other federally and provincially listed plant species of concern discovered during the pre-construction surveys. Copies of all correspondence and minutes of meetings demonstrating consultation in developing the program with appropriate regulatory agencies, including Environment Canada, shall be provided. The follow-up program shall include a schedule for filing reports with the Board.

5.6 Wildlife

Approximately 277 species of mammals, birds, amphibians and reptiles are known to occur within the vicinity of the Project ROW, of which approximately 32 are species of concern. GSX PL chose wildlife in general as a VEC, and several species of concern, namely great blue heron, marbled murrelet, northern goshawk, and Keen's long eared myotis. Wildlife surveys carried out by GSX PL included a general wildlife habitat survey, bird nest survey, a survey for the presence and distribution of owls, and a bat community and habitat assessment.

Potential effects on wildlife, including sensitive species, could include: loss and alteration of habitat; sensory disturbance; and direct mortality. Effects were primarily focused on the possible loss of old growth forest and large woody debris in the study area, which would result in the loss of habitat for species such as owls, woodpeckers, bats and clouded salamander. GSX PL submitted that these habitat types are highly fragmented in the study area and have been avoided to a large extent through routing considerations. For example, the route was chosen to the extent possible to avoid bisecting unfragmented

forest interiors, to traverse agricultural land and existing clearings, and follow previously disturbed areas. As a result, the proposed route would directly alter forested wildlife habitat to early successional vegetation, with only one well-developed forest interior habitat area that is presently surrounded by development being affected. GSX PL reiterated that none of the old growth forest along the pipeline route is protected from harvesting activities.

Disturbance to nesting migratory birds, or any other bird, would be minimized by GSX PL's commitment to "pre-clearing" the ROW in advance of peak timing for bird nesting. Pre-clearing would occur prior to the 1 April to 31 July period, if other critical scheduling elements permit. Wildlife trees and snags would be retained within the perimeter of the ROW, especially along the eastern half of the route, if this does not compromise safety. To compensate for the loss of habitat provided by wildlife trees, GSX PL has committed to placing nest boxes, and possibly platforms, along the ROW to reduce potential effects to western screech owl, short-eared owl, barred owl and great horned owl. An additional breeding bird survey would be carried out prior to clearing to identify active nests of breeding birds. GSX PL would avoid each confirmed site by realigning the pipeline route or by fencing an exclusion area during construction. Where a conflict occurs between engineering requirements and confirmed sites, regional biologists would be consulted regarding the possibility of moving or re-establishing the site or appropriate compensation for the loss of the site (e.g., nest boxes for certain species). In the event that a listed species or species of concern is discovered during construction, the particular circumstance would be evaluated in consultation with the BC Ministry of Water, Land and Air Protection and the Canadian Wildlife Service to determine the most appropriate course of action.

After clearing, the ROW would be maintained in early stages of succession. This change would have some beneficial effects, in that the increased edge would promote utilization by other species, although this may be offset by the displacement of interior forest species. During operations, vegetation management would not be conducted during the restricted period (1 April to 31 July), to minimize effects on migratory and other bird species.

GSX PL indicated that, in general, overall hunting access to the woodland areas along the ROW is not limited by lack of physical access but more by landowner restrictions. To further limit this effect, GSX PL indicated that it would roll back slash on all ROW segments in wooded areas where landowner permission is granted and install boulders, gates and fencing as requested by landowners or land managers. Furthermore, a seed mix that does not contain species especially attractive to ungulates would be used.

GSX PL submitted that the roads in the Project area are not suitable for fast vehicle travel and this feature will likely limit the potential for increased wildlife-vehicle collisions.

The Panel is of the view that GSX PL has, through routing and other mitigation measures, avoided and minimized potential adverse effects to wildlife. The Panel concludes that, with the route selection process undertaken and with the implementation of proposed mitigation measures, significant adverse effects to wildlife are unlikely. However, the Panel is also of the view that a pre-construction breeding bird nesting survey is appropriate as species may nest in areas that could be directly or indirectly disturbed by construction activities.

Recommendation 18

The Panel recommends that GSX PL file with the Board, at least 21 days prior to the commencement of clearing of vegetation or ground-breaking activities, the results of an additional detailed breeding bird survey to determine the presence of active nests of breeding birds within 100 m of areas to be disturbed during construction. Where active nests of breeding birds are observed, GSX PL shall also file a detailed mitigation plan for approval, including copies of all correspondence and minutes of meetings

demonstrating consultation with appropriate regulatory agencies, including Environment Canada, in developing the plan.

5.7 Species of Concern

GSX PL indicated that seven species of concern were documented during the wildlife field studies, including black-tailed deer, turkey vulture, bald eagle, pileated woodpecker, red-legged frog, great blue heron and purple martin. While no site-specific habitats for these species were observed along the ROW, habitat suitable for several other listed species was identified in the study area.

GSX PL indicated that potential habitats for federally or provincially listed species would be protected or restored where practical. For example, rocky outcrops near the landfall would be restored to retain the potential for reptile habitat (e.g., sharp-tailed snakes). Snags, which may offer nesting and perching habitat for raptors or cavity nesters, would also be avoided where other more compelling factors (e.g., safety) do not exist.

The Project would result in the conversion of forested wildlife habitat to meadow type habitat. GSX PL stated that cumulative effects of land use change and associated human activity on available habitat supply for wildlife VECs will, to a certain extent, mirror changes in distribution and supply of native vegetation in the study area. Added to this are effects associated with consumptive wildlife use, problem wildlife control and accidental mortality. In some cases, land use changes may have enhanced wildlife production for certain species (e.g., certain waterfowl and butterflies) in the area, particularly where these are associated with cleared areas such as pastures, fields, and orchards. Fragmentation effects, caused by clearing and increased road densities, will have reduced habitat suitability and security for several forest-associated wildlife VECs such as marbled murrelet, northern goshawk and Keen's long-eared myotis.

Red-legged frogs are most sensitive to disturbance when in the egg and tadpole stages. In the Project area, observations indicate there may be mobile froglets by late June. The species and its habitat appear to be common locally. GSX PL stated that riparian habitats would be protected through mitigation measures that ensure the restoration of surface drainage patterns. Further, GSX PL would salvage any amphibians from any occupied habitats, where these are encountered, and place them in similar habitat adjacent to the ROW, where appropriate. Wetland drainage and contours would be maintained following construction.

The oldest forest stands on Cobble Hill could potentially be used for breeding by marbled murrelet, although none were observed during the field surveys. The proposed route would result in the removal of 0.5 ha of this habitat.

GSX PL noted that residual mature forest cover within the local study area still have characteristics moderately suitable for northern goshawk and should be retained where possible. No northern goshawk nests or bird observations were documented in the vicinity of the Project.

A bat community and habitat assessment conducted along the route indicated the presence of big brown bats, silver-haired bats, Blue-listed Townsend's big eared bat and *Myotis* spp. and one California myotis. GSX PL stated that large wildlife trees within the local study area could have a residual value for this species.

Mitigation measures for sensitive species proposed by GSX PL, to reduce possible habitat loss, include retention of wildlife trees where possible, avoidance of rocky areas, proper watercourse crossing techniques, maintenance of post-construction hydrology of wetlands, and effective ROW restoration.

The Marine Coalition identified a blue heron colony approximately 1 km from the proposed ROW and submitted that the failure to identify this colony near the landfall at Manley Creek is symptomatic of deficiencies in the environmental assessment. Concerns were raised by Intervenors relating to disturbance of

the colony during construction and the effects of pipeline overflights during operation.

With respect to the three main issues of concern related to great blue heron, the Panel notes that the colony is approximately 1 km away from landfall at Manley Creek and is adjacent to a residential subdivision. At Boatswain Bank, where great blue heron have been observed feeding, GSX PL submitted that the use of the HDD would mitigate any potential impact on the herons. Should the HDD fail, and a partial HDD or full open cut be required, GSX PL submits that the route has been re-aligned to avoid an adjacent eelgrass community that is recognized as being part of the habitat used by the great blue heron. During construction, any displacement of birds is likely to be temporary, as they are likely to move short distances to other parts of the feeding habitat.

With respect to assessing effects to species of concern, GSX PL indicated that no formal thresholds or retention guidelines exist with regard to wildlife habitat against which effects, including cumulative effects, can be further measured or assessed.

The Panel is of the opinion that the distance between the colony and the proposed ROW and landfall is a mitigating factor. The Panel notes that maintenance overflights during operation, while at a low altitude, would be over the pipeline route, which is some distance removed from the heron colony. As such, the flights are not likely to affect the reproductive output of the heron colony. Furthermore, GSX PL has considered the locations and types of habitat where species of concern could be affected by the Project. The Panel is of the view that to the extent feasible GSX PL has avoided critical habitat and otherwise developed measures to mitigate potential effects on species of concern. Recommendations of the Panel related to listed plant species of concern and breeding bird surveys will further address these issues. The Panel concludes that, with the implementation of proposed mitigation measures and the Panel's recommendations, significant adverse effects are unlikely.

5.8 Environmentally Sensitive Areas (ESAs)

GSX PL submitted that the terrestrial portion of the proposed route does not cross the boundaries of any existing provincial or national parks; ecological reserves; protected areas; Heritage Rivers; Wildlife Management Areas; Special Resource Management Areas; Use, Recreation and Enjoyment of the Public Reserves (UREP); Reserve areas; BC Ministry of Forests (BC MOF) recreation reserves or any sites and managed area designated by the BC Conservation Data Centre (BC CDC). However, the Project study area included, or was in the vicinity of, a number of existing regionally, provincially and federally protected or important recreational areas.

Possible effects of the Project on ESAs include disturbance to: parks and the users of these parks from noise, dust or traffic during construction; two sensitive ecosystems identified under the Sensitive Ecosystems Inventory (SEI); and the coastal zone ecosystem at the landfall. Potential adverse effects could involve reduced productivity and biodiversity within ESAs. This, in turn, would reduce human benefits associated with enjoyment of these locations and associated flora and fauna. GSX PL concluded that no effects are likely on protected and designated areas during construction, operation and maintenance, with the possible exception of the coastal zone ecosystem.

GSX PL defined the coastal zone ecosystem as lands within 500 m of the shoreline. Coastal zone ecosystems are biologically and culturally significant areas. Plant communities associated with these sites stabilize shorelines and control rates of erosion and material deposition in intertidal and offshore subtidal areas. A variety of wildlife, marine fish and invertebrate species occupying or otherwise using nearshore and foreshore areas are directly affected by coastal developments. These areas are of considerable importance as areas of human resource use and culture.

The landfall location would be directionally drilled to avoid the removal of vegetation shielding the foreshore area from the upland area. GSX PL's plan for an HDD is not likely to affect the integrity of the coastal zone ecosystem as the entry point is set in a pasture approximately 150 m from the top of the forested slope and the exit point is about 430 m seaward of the shoreline. In the event an open cut is required, a detailed design would be used, along with an intensive reclamation program, to retain soil cover and promote rapid establishment of stabilizing and aesthetically appropriate native vegetation cover. Under such a scenario, GSX PL stated that direct effects on the coastal zone ecosystem would still be confined to a relatively small area (0.1 ha) but require a longer time frame (e.g., 3 years) to stabilize and revegetate.

After construction, biophysical elements of the zone would be restored except for an 8 m x 8 m valve site and a short access trail to it through an existing pasture. GSX PL stated that this area has already been subject to previous disturbance associated with agricultural land clearing and park development. Activity at the valve site would be very infrequent, and GSX PL submitted that the Project would not contribute materially to human disturbance already associated with use of the coastal zone at Manley Park. GSX PL stated that the Project would have a generally localized and short-term effect on the coastal zone ecosystem in the local study area.

The Panel is of the view that GSX PL has attempted to avoid ESAs to the extent practical and has proposed appropriate mitigation measures. The Panel concludes that with the implementation of the proposed mitigation measures, significant adverse environmental effects to ESAs are unlikely.

6. Effects On Socio-Economic Conditions

6.1 Noise and Visual Aesthetics

GSX PL predicted an increase in construction-related noise during working hours throughout construction despite best efforts to minimize the effects. Mitigation measures include adhering to scheduled construction hours and having the contractor provide multi-person transportation (e.g., bus, van or crew cab) for workers. During operations, noise would occasionally occur as a result of maintenance vehicles in the area, weekly flyovers of the ROW, maintenance activities at the Centra interconnect and scheduled blowdowns. GSX PL stated that the Centra interconnect would be equipped with a "blowdown silencer", and all gas would be routed through this equipment to muffle noise effectively during blowdown.

GSX PL indicated that the landscape in the local and regional study area has been under continual change since European settlement. Changes in viewscapes resulting from the Project would be most noticeable from recreational hiking points such as Cobble Hill, Shawnigan Beach Estates and Kaptara Trail, where the ROW crosses Thain Road at Cobble Hill, and from Manley Creek Park access trail. In the unlikely event of a full open cut of the Manley Creek landfall, a further impairment of the residual coastal zone landscape would occur. The Centra interconnect, which includes the installation of a 44 m communication tower, would affect the viewscapes of nearby residents.

GSX PL stated that on previously forested segments, mitigation measures would include selective planting of trees and shrubs for visual screening. GSX PL does not currently plan to light the communications tower at the Centra interconnection. Furthermore, GSX PL stated reclamation measures would be implemented to minimize the potential for long-term visual effect of the ROW across agricultural lands. The Project would represent a small percentage reduction in the amount of contiguous forested landscape in the local study area. Reclamation of the ROW would at the same time create a "green space" landscape amenity not subject to further development over the life of the Project.

The Panel concludes that, given GSX PL's proposed mitigation measures, significant adverse effects resulting from noise and visual effects of the Project are unlikely.

6.2 Commercial and Recreational Fishery

GSX PL stated that the construction and operation of the Project would create possible short- and long-term effects on fishing and aquaculture activities. For example, during pipe lay and trenching operations, fishers would be unlikely to fish in proximity to the moving construction vessel. Crab fishers active in the area during construction would be forced to pull their gear to avoid damage or loss. Additionally, any Project effects to marine biota would have the potential to affect commercial and recreational fisheries, which are dependent upon these resources.

GSX PL stated that commercial fishing, sport fishing and aquaculture activity take place in the Project area and are concentrated in the Moresby and Portland Island area, Plumper Sound, Swanson Channel, Satellite Channel and Boatswain Bank. Commercial fishing for crab, shrimp, ground fish, sea urchin, sea cucumber, geoduck clams and salmon is the dominant fishery in the Project area. The proposed route was aligned north of Moresby and Portland Islands to accommodate commercial fishing interests and avoid areas of highest productivity.

During GSX PL's consultation with resource harvesters in the area, the Gulf Crab Fishers Association (GCFA) and the Underwater Harvesters Association raised concerns about effects on their industry from the Project. GSX PL concluded an agreement with the Underwater Harvesters Association. GSX PL also concluded an agreement in principle with the GCFA regarding the potential effects to the crab fishery during construction. Regarding long-term effects, GSX PL stated that, if a Project related loss could be demonstrated, compensation would be considered and a co-managed compensation claims committee would be established to review these claims. However, the GCFA does not believe the monitoring and follow-up programs proposed by GSX PL would be accurate enough to provide the basis for a compensation claim for the crab fishers. GSX PL stated that the benefits of the monitoring could not be fully achieved without the cooperation and assistance of the fishers and that a program would be established for reporting tagged crabs. Additionally, CGFA argued that further studies of ecological interactions and techniques that measure the potential effects of the Project must be established before approval is granted. In this regard, the Panel notes Recommendation 7 whereby GSX PL would be required to file for approval with the NEB, a follow-up program related to potential barrier effects.

Commercial and recreational fishers may experience some disruption of activities or inconvenience during construction and to a lesser extent during operation in the areas where the pipeline is not buried. To address these issues, GSX PL stated they would, to the extent possible, notify licensed fishers in the area about the construction schedule approximately four weeks in advance of construction to allow removal of all equipment in the vicinity of the route and to allow fishers to schedule fishing activities away from construction activities. Furthermore, GSX PL would optimize scheduling of the lay barge and trenching barge so that the total duration of disturbance is reduced and that more sensitive periods are avoided, to the extent practical. Finally, GSX PL committed to regular communication with fishers, including a pre-construction meeting to review the construction plan; posting construction-related details in local marinas and newspapers to inform commercial and recreational fishers in the area; and, during operation, maintaining dialogue with fishers concerning any potential ongoing inconvenience or other issues arising from operation and attempting to address concerns to both parties' satisfaction. GSX PL stated it would pay for Project-related loss or damage to gear during construction.

The Panel encourages GSX PL and the GCFA to finalize an agreement to address outstanding concerns regarding the impact on the crab fishery during construction and operation. The Panel concludes that, with the implementation of mitigation measures, significant adverse effects to commercial and recreational fishery are not likely to occur as a result of the Project.

7. Effects on Physical and Cultural Heritage

7.1 Terrestrial Physical and Cultural Heritage

GSX PL conducted a heritage resource impact assessment of a 30 m wide corridor along the proposed terrestrial route. Two archaeological sites were identified. A shell midden (site DeRv 159) was found approximately 25 m north of the ROW boundary. GSX PL determined that no direct effects on the shell midden site are likely unless the route is realigned or temporary workspace is required for construction. Fourteen culturally modified trees (site DeRv 160) were identified. GSX PL stated that these trees are relatively young, most likely dating to the past decade, suggesting low scientific significance, and are located within private land and potentially subject to logging. GSX PL stated that, contingent on final refinement with the landowner, these trees may or may not be removed. No known heritage resources sites or protected traditional sites would be disturbed by the Project; however, archaeological monitoring of clearing and grading of the ROW would be undertaken in the vicinity of DeRv 159 as well as any other areas recommended by GSX PL's archaeological consultants. If archaeological materials are uncovered during construction, the Heritage Resource Discovery Plan would be implemented, including immediate shutdown of work until the find can be properly evaluated by trained archaeologists in cooperation with the Sencot'en Alliance.

GSX PL stated that approximately one third of the route alignment was not surveyed for heritage resources because access had been denied by landowners but field study work would be completed once access is obtained to all properties. GSX PL does not expect any heritage resources with moderate or high significance would be encountered on the unsurveyed areas; however, should an archaeological site be found during the field study, appropriate mitigation as described above would be applied.

As a survey for the remaining portions of the terrestrial route would be completed at some time in the future, the Panel recommends that the results of that survey and proposed mitigation measures be filed for NEB approval. The Panel also recommends that GSX PL

file with the NEB any comments received from provincial authorities. The Panel concludes that, with the implementation of the proposed mitigation measures and the Panel's recommendation, significant adverse effects to terrestrial physical and cultural heritage are unlikely.

Recommendation 19

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of clearing of vegetation or ground-breaking activities or within a time otherwise directed by the Board, a heritage resource impact assessment, including any additional mitigation measures, for the portions of the ROW not previously surveyed. The filing shall also include any comments and recommendations on this assessment and proposed mitigation from the British Columbia Ministry of Sustainable Resource Management, Archaeology Branch with a statement on whether GSX PL intends to implement the recommendations.

7.2 Marine Physical and Cultural Heritage

An Underwater Archaeological Assessment was completed for the marine portion of the pipeline. No archaeological sites or other cultural resources were identified and it was determined that the potential for finding unidentified archaeological sites within the study area was low. However, the potential for unidentified archaeological sites at the HDD exit point working space above the 13 m contour was considered moderate. If sites do exist at this location, GSX PL determined that they are likely to be buried reef-net anchors or pre-contact settlements sites, the integrity of which is unlikely to be impacted by short term anchoring activities.

GSX PL agreed to monitor for unforeseen archaeological effects during construction. To address unanticipated discoveries of archaeological remains in the marine portion, GSX PL stated that the Environmental Inspector or Supervisor would be responsible for stopping all work in the immediate vicinity and arranging for an archaeologist to evaluate the discovery. The archaeologist would implement the appropriate treatment measures, including contacting the provincial authority responsible for archaeology and the appropriate First Nations. The archaeologist would also provide a report on the methods and results.

As the final underwater archaeological assessment was filed late in the process and had not been provided to the provincial authority responsible for archaeology, the Panel recommends that any comments received from the provincial authority be filed with the NEB.

The Panel concludes that, with the implementation of proposed mitigation measures and the Panel's recommendation, significant adverse effects on marine physical and cultural heritage are unlikely.

Recommendation 20

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of HDD operations or marine pipe lay operations, whichever is sooner, or within a time otherwise directed by the Board, any comments and recommendations on the underwater archaeological assessment and the proposed mitigation from the British Columbia Ministry of Sustainable Resource Management, Archaeology Branch and a statement on whether GSX PL intents to implement the recommendations.

8. Effects on Traditional Use

The Project has the potential to affect the current use of lands and resources by Aboriginal persons for traditional purposes. Previous sections of this Report have discussed the general effect the Project will have on lands and resources. This section will discuss the impact of the Project on the use of those lands and resources for traditional purposes.

To assess the impact of the Project on traditional use activities, traditional land use studies were prepared by the Sencot'en Alliance, the Cowichan Tribes and the Tseycum First Nation for both the land and marine portions of the Project area. These studies were, at the request of the First Nations, filed confidentially with the Panel.

Although the Tsawwassen First Nation indicated to GSX PL that they were interested in undertaking a study of traditional use around the proposed route throughout the Gulf Islands, a study was not completed as the First Nation did not respond to offers by GSX PL to fund such a study. In response to a request from the Panel, GSX PL stated that it had no information that the Tsawwassen people are using the lands and resources in the vicinity of the Project for traditional purposes.

A traditional land use study for the Malahat First Nation was not prepared specifically for the Project; however, information from existing studies of the Malahat First Nation's traditional use activities was incorporated into GSX PL's application and assessment.

GSX PL is aware that plant harvesting sites may be located in proximity to the pipeline; however, they have not been advised of any current harvesting of plants for traditional purposes in the area of the ROW. GSX PL stated that, should there be current harvesting of plants for traditional purposes, any effect on traditional plants such as berries, plants used for medicinal purposes, food, firewood or other special plants and woods, are anticipated to be short term and low in magnitude, and the plants are expected to recover to some extent after construction. Harvesting of plants for traditional purposes may be restricted in active construction areas for short periods for safety reasons; however, the collection of plants will not be restricted during operation. Access to

traditional harvesting areas may potentially increase as a result of the ROW being maintained in an early successional state.

First Nations indicated that the entire terrestrial route is important for traditional hunting, in particular the areas around Cobble Hill, Shawnigan Lake, Pauquachin's Hatch Point Reserve and Boatswain Bank. GSX PL stated that access to the ROW on Crown lands may be limited during construction due to concern for public safety or initially after construction for reseeding and to protect environmentally sensitive areas; however, it will not be restricted during pipeline operation. Noise generated from construction will likely displace animals along or immediately adjacent to the ROW, thus temporarily altering any potential opportunities for hunting near or on the ROW in the short term.

First Nations use the area of the proposed Project for traditional harvesting of marine resources including fish, shell fish and seaweed. Areas of particular use are Cape Keppel and Boatswain Bank. The Boatswain Bank area is highly valued for traditional uses such as shell fish harvesting and the pipeline will cross a number of areas identified as being used for salmon or cod fishing, particularly neighbouring the shores of Saltspring, the Pender and Saturna Islands. GSX PL stated that no fishing methods used by First Nations would be affected by the Project; however, access to specific fishing sites may be restricted for a short duration during construction activities.

GSX PL stated that there is some potential for disturbance to intertidal and near subtidal benthic communities if the HDD is unsuccessful and an open cut is required. In this event, some loss of infauna, such as butter clam, could occur along the ROW, although the cobble dominated beach suggests this species is likely restricted to the subtidal depth range beyond which any harvesting would be more limited. The area potentially impacted in this case occurs within an existing bivalve closure area due to fecal coliform contamination and, as such, should not directly affect First Nations' present harvesting opportunities. It is likely that bivalves will recolonize the area of disturbance prior to any significant change in contamination and thus future harvesting opportunities will not likely be affected.

GSX PL stated that they would seek input from First Nations to avoid or otherwise appropriately reduce adverse effects on current traditional use activities. Since the filing of the application, GSX PL has concluded agreements with those First Nations who had expressed concern about the impact the Project may have on their interests and these First Nations have stated their concerns have been addressed.

Post construction monitoring and follow-up programs would be used to evaluate the accuracy of the assessment of potential adverse effects and further mitigation or restoration measures implemented as necessary.

Given that GSX PL has addressed the concerns First Nations had expressed regarding the impact the Project may have on their interests and it is unlikely there will be significant adverse effects to the resources used for traditional purposes, it is also unlikely that the Project would cause significant adverse effects to the current use of lands and resources for traditional purposes by aboriginal persons.

9. Cumulative Environmental Effects

GSX PL assessed potential cumulative effects of the Project as an integral part of its environmental assessment by considering Project interactions with other developments, human activities and biophysical factors.

The methodology followed Agency guidance by scoping the assessment to consider residual effects and identifying study boundaries and other projects and activities that could affect the VECs from a cumulative perspective. Spatial and temporal boundaries for the assessment of each of the terrestrial and marine VECs were established to ensure the assessment reasonably and practically embraced areas of marine and terrestrial habitat, resource use and species most likely to be directly affected by the Project at different spatial scales. With respect to the marine environment, many of the species in the area have distributions and movements that extend through much of the southern Strait of Georgia and the Strait of Juan de Fuca and are broadly connected to habitats and meta-populations along the entire Pacific Northwest. For terrestrial VECs, the assessment was primarily habitat based with additional consideration given to potential disturbance at critical life-stages. The selection of other projects and activities for the assessment was based on their potential to affect the same VECs within the local or regional study areas.

GSX PL's analysis contained a combination of qualitative and quantitative techniques to assess potential cumulative effects on VECs. The level of detail in the analysis reflected the extent to which a cumulative effect on a VEC would be probable, its likely scale or magnitude, as well as the extent to which the effect could reasonably be quantified and described relative to the receiving environment.

Intervenors, such as the Marine Coalition, submitted that without adequate baseline characterizations it would not be possible for the Panel to adequately consider factors such as the significance of environmental and cumulative effects and measures that would mitigate effects (see section 2.4.1).

The Panel first considered GSX PL's approach in the context of guidance provided by the

Agency. The Panel considered cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out. One of the first steps in assessing potential cumulative effects of a project is to identify any anticipated residual effects from the project that would remain following implementation of mitigation measures. Residual effects of a project could act in combination (i.e., cumulatively) with other projects and activities to adversely affect VECs. The analysis demonstrates that potential adverse environmental effects of the Project could be mitigated so that few residual effects would remain to interact with other projects and activities to cause cumulative effects within the identified spatial and temporal boundaries. The Panel found that the baseline information available provided an adequate basis for considering potential cumulative effects of the Project. Where relevant, discussions related to specific VECs and cumulative effects are provided within the respective sections of this Report (e.g., GHG in section 5.4.2).

In assessing significance, the Panel notes that in many cases thresholds or guidelines and objectives for evaluating effects, including cumulative effects on VECs, are non-existent. In these situations, the Panel has considered GSX PL's criteria such as magnitude, duration, spatial extent, probability, permanence and professional judgment. For example, the Panel recognizes the potential for contaminants to be remobilized during the jetting process, as discussed in section 4.3.1. Uncertainty remains regarding the actual amount of contaminants present along sections of the pipeline route that were not sampled and, therefore, the Panel recommended a sediment sampling plan (Recommendation 5) to address this uncertainty if jetting is to be used.

The Panel is of the view that although GSX PL's approach to examining the issue of cumulative effects was not supported in all cases by quantitative baseline information, the approach was adequate. Given the nature of the Project, GSX PL's proposed mitigation measures, the recommendations of the Panel, and the limited extent of any residual effects, the Panel concludes that significant adverse cumulative effects of the Project are unlikely.

10. Accidents and Malfunctions

GSX PL identified the following accidents and malfunctions that could occur during construction and operation of the Project:

- frac-out (i.e., inadvertent drilling fluid escaping to the surface through fractures in bedrock or surficial deposits) during the HDD;
- hydrocarbon spills during construction or operation;
- rupture of, or damage to, foreign pipelines and cables during construction;
- fire during construction or operation; and
- pipeline break caused by third party damage, corrosion, earthquakes or submarine terrain hazards.

Each of these is discussed below.

GSX PL submitted that HDD frac-outs are an inadvertent return to the surface of drilling mud as it is forced through fractures in the bedrock or interstitial spaces of the surficial deposits, and that such occurrences are not uncommon. GSX PL committed to implementing its Drilling Mud Release Contingency Plan in the event of a drilling mud release. The contingency plan involves the suspension of drilling operations, notification of applicable federal and provincial government agencies, and clean up procedures before the resumption of construction activities.

GSX PL stated that it selected an inert bentonite clay-based drilling mud to eliminate the potential for toxic effects of any mud release and that HDD mud returns over the drill path would be monitored during the drilling operation.

GSX PL stated that in the event of a spill during construction it would implement its Terrestrial Spill Prevention and Spill Contingency Plan or its Marine Spill Prevention and Spill Contingency Plan. These documents describe GSX PL's proposed prevention and contingency measures to minimize any adverse effects of a spill. The plans include initial response, containment and reclamation procedures. In the event of a major spill in the vicinity of porous surficial materials or fractured bedrock, a water well monitoring program would be initiated as part of the response.

GSX PL stated that all existing lines and cables would be located and flagged by using a "one call" service or by contacting the owners or operators of the facilities. GSX PL further submitted that pre-construction contacts and field marking would be done and all known locations of underground facilities would be carefully exposed in accordance with prescribed methods to minimize potential damage to or rupture of foreign lines.

GSX PL stated that fire is a risk during clearing and slash disposal operations. GSX PL submitted that burning of slash would only occur in accordance with BC MOF Regulations (BC Ministry of Forests 1999) and that strict measures would be enforced on the ROW during high fire hazard periods. GSX PL further stated it would require all contractor personnel to participate in a safety and environmental training session, which would include instruction on the use of fire fighting equipment.

GSX PL stated that a pipeline break, and subsequent gas release and possible explosion would be of major concern to GSX PL and the public. GSX PL further stated that in the worst case, a pipeline break on the terrestrial portion could result in a large gas volume release and a potential explosion and fire that would create a significant hazard within approximately 500 m of the pipeline.

In response to concerns about the safety of the pipeline, GSX PL stated that safety risks are primarily identified, assessed and mitigated through the design, construction and testing phases of the pipeline. Further, GSX PL stated that risk management is done to identify mitigation measures that could be implemented to reduce the risk of any segments of the pipeline that are rated as relatively high compared to the rest of the pipeline. GSX PL stated that the entire terrestrial portion of the pipeline would be built to CSA Z662 Class 3 location designation.[6]

GSX PL also provided information on its Emergency Preparedness and Response Program.

Intervenors, including GSXCCC, expressed concern about the proximity of the Evergreen Independent School to the pipeline and the effect a pipeline rupture and subsequent fire could have on the buildings and its occupants. GSXCCC requested that GSX PL submit a quantitative risk analysis that would provide criteria regarding the hazard posed by a pipeline failure and subsequent ignition of the escaping natural gas.

> **"...the school is still in the 500 meter hazard zone, ...how would people and property within this zone be impacted by a rupture or a leak? ...what levels of thermal radiation would you consider to be a non-lethal dose to a human being?"** ***(Marine Coalition - JPR Hearing Transcripts, 11 March 2003, Volume 12, Para 19908,19914,19928)***

GSX PL submitted a report entitled Quantitative Risk Calculations for GSX Pipeline at the oral hearing, indicating that under a worst case scenario the furthest distance from the pipeline to a thermal radiation level of 15 750 watts/m^2 (5000 BTU/hour/square foot) is about 157 m. GSX PL stated that a thermal radiation of 15 750 watts/m^2 is a value typically used to indicate the level at which fatalities may possibly occur. The report indicates that, as the school would be about 260 meters from the pipeline, it would experience a much lower thermal radiation level of approximately 5 000 watts/m^2. The report also indicates that, under a worst case scenario, the school building would provide any occupants with protection from a pipeline rupture and subsequent fire for an indefinite period of time.

In response to questions regarding the Skeleem Recovery Centre, GSX PL stated that, although the Skeleem Recovery Centre was slated for closure in February 2003, it was considered as

[6] In accordance with CSA Z662-99, class location designations are determined on the basis of class location assessment areas and on the buildings, dwelling units, places of public assembly and industrial installations contained in such areas. Assessment areas are 1.6 km long and extend 200 m on both sides of the centre line of the pipeline. Assessment areas that contain 46 or more dwelling units are designated as Class 3 locations for the purpose of determining various design factors. CSA Z662-99 states that consideration shall be given to designating areas that contain institutions where rapid evacuation may be difficult, such as hospitals or nursing homes, as Class 3 locations.

being operational for the purposes of the risk assessment. GSX PL stated that the pipeline, designed to a Class 3 location designation, meets the appropriate standards for a pipeline passing by a facility such as the Skeleem Recovery Centre.

GSX PL stated that in the marine environment, a line break is less likely to result in creation of a significant hazard due to the lack of potential ignition sources, flammable materials and the anticipated rapid atmospheric dissipation of the gas bubble stream.

Concerns were expressed by Intervenors over a submarine line break and the potential adverse effect of the gas in the marine environment (i.e., any toxic effects of natural gas (methane)). GSX PL stated that a sudden large volume gas release in the marine environment would result in temporary scour of sediment and increased turbidity depending on the orientation of the break. It further stated that this effect would likely be confined to within a relatively small area due to gas expansion and hydraulic resistance. Furthermore, GSX PL stated that methane is a natural and common molecular component of seawater and benthic sediments in the study area.

To minimize the potential for line breaks, GSX PL considered factors such as route selection, pipeline design and construction, and maintenance procedures. For example, GSX PL stated the Project would meet or exceed all applicable pipeline design engineering and construction codes including automatic shut-off valves that would contain the release of natural gas; there would be continuous monitoring of system flow parameters (pressure, temperature, and flow conditions); and the pipeline design would maintain pressure containment in a 1/2475 year earthquake event (a probability of exceedance of 2 per cent in 50 years).

To minimize the consequence of a line break, GSX PL would install monitoring controls to sense the line break and permit remotely controlled valves to be closed. Emergency shutoff valves would be located at either end of the marine section of the pipeline as well as at the interconnect with Centra. Furthermore, GSX PL would invoke its Emergency Preparedness and Response Program (EPR) where appropriate.

GSX PL stated that its EPR would fulfill the requirements of the NEB, the U.S. *Occupational Safety and Health Act*, the U.S. Environmental Protection Agency, and the U.S. Department of Transportation. GSX PL also stated that the program would meet the requirements set out in the NEB's 24 April 2002 Memorandum of Guidance (MOG) (all company letter, file 172-A000-73) regarding Security and Emergency Preparedness and Response Programs.

In specific reference to the EPR program elements as outlined in the 24 April 2002 MOG, GSX PL would include the following components:

- EPR Program Development (Hazard Assessment);
- Emergency Procedures Manual;
- Liaison Program (First Responders);
- Continuing Public Education Program;
- Emergency Response Training;
- Emergency Response Exercises;
- Incident and Response Evaluation; and
- Emergency Response Equipment.

The Panel is of the view that GSX PL has taken an acceptable approach in identifying and assessing hazards associated with the Project. Further, the Panel notes that GSX PL has designed the terrestrial section of the pipeline for a Class 3 location designation, which meets or exceeds the requirements of CSA Z662.

The Panel is of the view that the likelihood of an accident or malfunction of the Project would be low and effects would be mitigated to the extent practical given GSX PL's policies, practices and procedures and its commitment to implement them.

The Panel concludes that significant adverse environmental effects due to accidents and malfunctions are unlikely.

11. Effects of the Environment on the Project

Potential effects of the environment on the Project relevant to the marine section of the pipeline include: environmental corrosion; wave and current actions; possible dune migration; seismic shaking; and geotechnical instability. The potential effects of the environment on the Project identified for the terrestrial pipeline include: environmental corrosion; seismic shaking; and geotechnical instability. In conjunction with possible changes in surface and groundwater flows, GSX PL also identified a need to address possible effects of a high water table on pipeline stability. GSX PL stated that the Project would be designed and constructed to resist the effects of the environment.

The pipeline has been designed to resist external corrosion. The marine and terrestrial sections of the pipe would be coated with external bonded epoxy to protect the steel from the external environment. The marine section would also be encased in a concrete coating, which would act to protect the epoxy coating from damage. Both the marine and terrestrial pipeline sections would be protected against oxidation through the use of cathodic protection systems. These systems would be designed and maintained to remain effective for the approximate 40-year life of the Project. In addition, corrosion surveys would be conducted to confirm the effectiveness of the corrosion protection measures.

During construction and operation, the marine pipeline would be subjected to the effects of currents, waves and storms and, possibly, dune migration. Both the terrestrial and marine sections of the pipeline could be subjected to seismic events and earthquakes.

The primary effect of currents, waves and storms on the marine pipeline would be the application of hydrodynamic loads, which could cause the pipeline to move or strain, leading to damage or failure. GSX PL committed to establishing environmental criteria limits for pipeline design that would ensure that the pipeline resists these loads during construction and operation. For example, during construction, storm forecasting would be employed, as well as monitoring of waves and currents. In the event that a criterion limit is observed or predicted to occur, pipe lay operations would cease and protective measures would be taken. The marine pipeline has been

designed to remain stable on the sea bottom during operation. For example, the concrete coating would ensure that sufficient negative buoyancy is maintained to resist lateral sliding or floating for all operational conditions. The stability of the pipeline on the seabed could also be checked, if necessary, by using internal pigging tools or with ROV surveys.

During the route investigation surveys, large submarine sand dunes were identified in proximity to the pipeline route. It was not established whether the dune field is mobile or static. Because interaction of large migratory dunes with the pipeline could lead to strains and loads that could damage or rupture the pipeline, GSX PL relocated the route to the outer edge of the dune field where interaction would not be expected to occur.

The direct effect of seismic loading on the marine section of the pipeline would be through fault offsets or shaking of the pipeline. Large loads and strains on the pipe could lead to damage or failures. GSX PL stated that the pipeline has been located, where possible, to avoid potentially active faults. However, where the pipeline does cross potentially active faults, the pipeline would be placed on the seabed surface and be oriented to cross the fault at 90° to reduce potential loads. In addition, the marine section of the pipeline would be designed to resist offsets of three metres without damage to the pipeline.

No active faults have been identified along the route of the terrestrial pipeline. The effect of shaking by earthquake is negligible in areas where the pipeline is buried (i.e., terrestrial and marine) or in contact with the seabed. The pipeline would also be designed to resist seismic-related movements where the pipeline is suspended above the seabed. For the terrestrial portion, the pipeline, pipeline components and their supports would be designed to resist seismic related movements where the pipeline and its components are above ground (e.g., valve locations and the Centra interconnect).

Areas of geotechnical instability, which include soil liquefaction or soil movements by sliding or spreading, were identified during routing surveys. Liquefaction of soils occurs when saturated sandy soils are subjected to vibration or dynamic loads caused by wave action or earthquake. Areas along the route have been identified which are expected to liquefy under seismic loading conditions. The liquefaction of soils supporting the marine pipeline may lead to increased loads and strains resulting from the pipeline either sinking or floating in the liquefied soil. GSX PL stated that the pipeline would be designed to resist the loads imposed on it by liquefaction of supporting soils. Movements of soil supporting the marine section, or the downslope movement of soils above or below the pipeline, could also result in loads being applied to the pipeline which lead to pipeline damage or failure. GSX PL stated that the pipeline would be designed to resist such movements. For example, in the area of ER 67, the pipeline would be supported by piles driven into the seabed to resist downslope soil sliding movements. With respect to the terrestrial section of the pipeline, geotechnical surveys were ongoing; however, to date, no areas where slides or lateral spreading of soils is expected to occur have been identified.

For the terrestrial section during various phases of construction, water would accumulate in the open trench, either from groundwater intrusion or precipitation. The trench would be de-watered periodically, as necessary, to prevent sedimentation and facilitate construction. GSX PL identified measures for trench stabilization that would be required in combination with dewatering in the areas of high groundwater and looser, softer soils (e.g., excavating flatter trench slopes or deployment of moving shields to shore the trench excavations). GSX PL estimated that about 10 per cent of the terrestrial length of the pipeline would be subject to buoyancy issues, at least during part of each year, due to the high water table. Concrete swamp weights or continuous encasement of the pipeline in a concrete sleeve would be used to reduce potential buoyancy problems in these areas.

The Panel is of the view that GSX PL has adequately considered the potential effects of the environment on the Project in the design of the pipeline and in developing policies, practices and procedures to account for the effects of the environment on the Project, and by committing to implement them. On the basis of GSX PL's commitments and Panel's recommendations presented in this Report, the Panel concludes that there are not likely to be significant adverse effects of the environment on the Project.

12. Decommissioning and Abandonment

The Panel notes that under the CEA Act, it is required to consider the potential effects of decommissioning and abandonment in relation to the Project. GSX PL provided a general discussion of options for decommissioning and abandonment of the pipeline at the end of its useful life and acknowledged that specific details would be developed as part of a future abandonment plan. Although GSX PL indicated that future land and ocean management practices relevant to pipelines are likely to change, under current practices decommissioning and abandonment could include pipeline removal, abandonment-in-place, or a combination of both. At a minimum, all surface facilities would be removed and the sites reclaimed. Any environmental effects would likely be similar to those observed during construction of the pipeline.

GSX PL's decommissioning and abandonment plan would be developed to comply with current and acceptable regulatory standards of the day, and in consultation with stakeholders holding an interest in the land disposition. Appropriate applications would be filed and standards followed. Public safety and environmental protection would be key components of the plan.

The Panel notes that future practices and procedures for decommissioning and abandonment of pipelines are likely to change. However, under the present regulatory regime, a proposal to decommission or abandon a pipeline such as the Project would require an application to the NEB under the NEB Act and would likely trigger the CEA Act and a hearing. The Panel also notes that any activities relevant to decommissioning and abandonment of the Project would likely be similar in scope to the installation of a new pipeline should the pipeline be removed. Should the pipeline be abandoned in place, issues such as potential ground subsidence, soil and groundwater contamination, and creation of water conduits, and cleaning the pipe in preparation for abandonment would need to be addressed. An abandonment plan would need to be designed to minimize any potential effects to the environment and land use.

Given the conceptual abondonment plan of GSX PL and the Panel's knowledge of existing techniques for the decommissioning and abandonment of pipelines as well as the Panel's conclusions regarding the environmental effects of the Project, the Panel concludes that significant adverse effects from decommissioning and abandonment are unlikely.

13. Capacity of Renewable Resources

GSX PL assessed the potential for the Project to have an adverse environmental effect on the capacity of renewable resources such as fishing, farming, forestry, outdoor recreation and downstream water users. From this assessment, GSX PL concluded that since the Project is not likely to cause significant adverse environmental effects on any of these components, the capacity of renewable resources to meet the needs of the present and those of the future is not likely to be significantly affected by the Project.

The Panel notes that for each of the renewable resources potentially affected by the Project, various sections of this Report provide a consideration of whether significant adverse effects to the "capacity" of that resource are likely to occur. The nature of potential effects to the capacity of renewable resources was considered along with criteria for evaluating significance such as the length of time for recovery. For example, in relation to agricultural activities, the Project would have a short-term effect. GSX PL's mitigation measures contained in its Terrestrial EPRP, such as topsoil handling procedures and reclamation measures, would mitigate potential effects so that significant adverse environmental effects are unlikely. Should any residual effects to crop productivity be observed, landowners may be compensated by GSX PL.

In relation to fishery resources and the barrier effect on the marine portion of the pipeline, the Panel has made a recommendation that GSX PL develop a follow-up program to verify the accuracy of the environmental assessment predictions and assess the effectiveness of mitigation. GSX PL would carry out crab trapping and tagging studies to assist in this assessment. Should losses to fishery resources be attributed to the Project or its associated activities, one option is compensation (Refer to section 6.2 for further details). However, based on the implementation of mitigation proposed by GSX PL, adverse effects to the productive capacity of the marine fishery resources are unlikely.

The Panel is of the view that for each renewable resource that could be affected, GSX PL has proposed adequate mitigation. Additionally, on the land portion of the

Project, once the pipeline is decommissioned and abandoned, the land would be available for former uses further reducing any residual effects to the capacity of renewable resources.

The Panel is of the view that given the nature of the Project, the mitigation measures that would be implemented and the recommendations of the Panel, the Project is not likely to cause significant adverse environmental effects on renewable resources. Accordingly, the Panel concludes that the capacity of those resources to meet the needs of the present and those of the future is not likely to be significantly affected.

14. Environmental Compliance, Monitoring and Follow-up

14.1 Environmental Compliance and Monitoring

The EPRPs describe the environmental protection measures to be used during marine, landfall and terrestrial construction of the Project in order to minimize the potential effects identified by GSX PL. The EPRP is written in construction specification format and should be read with the Environmental Alignment Sheets (EAS) where specific mitigation measures will be applied. Contingency plans are provided to address non-routine conditions. GSX PL indicated that the EPRPs do not supercede the mitigation measures discussed in the environmental assessment, but instead provide a more detailed description of the measures to be implemented. All protection measures noted in the application including the EPRPs and EAS will be integrated into the construction contract documents for the Project.

GSX PL agreed to capture within the EPRP documents all environmental commitments, undertakings, or mitigation measures that have been identified or will be required in any future NEB Certificate to ensure implementation at the field level.

The involvement of full-time, qualified, well-trained Environmental Inspectors is a key component of GSX PL's environmental protection strategy. One Environmental Inspector would be assigned to each of the marine, landfall and terrestrial pipeline construction phases. The Environmental Inspectors, along with the Chief Inspector and contractor personnel, would ensure consistent compliance with the EPRP.

The Panel expects GSX PL to carry out its commitments in terms of the design and construction of the Project, and therefore makes the following recommendation.

Recommendation 21

The Panel recommends that GSX PL cause the approved facilities to be designed, manufactured, located, constructed, installed and operated in accordance with those specifications, drawings, schedules, and other information or data set forth in its Application or as otherwise adduced in evidence before the Panel during the GH-4-2001 proceeding.

GSX PL would require numerous approvals and authorizations relating to the Project. To

ensure that required permits are current at the time of construction, the Panel recommends that GSX PL maintain those permits and any subsequent variations on site to assist in environmental compliance.

Recommendation 22

The Panel recommends that GSX PL maintain at its construction office(s):

(a) copies of any permits, approvals or authorizations for the applied-for facilities issued by federal, provincial or other permitting agencies, which include environmental conditions or site-specific mitigative or monitoring measures; and

(b) any subsequent variations to any permits, approvals or authorizations.

GSX PL has developed numerous mitigation measures to address potential environmental effects. Many of these are contained in various documents that were brought before the Panel. The Panel expects that GSX PL would amalgamate all of these considerations and include those relevant to construction in the field in its EPRPs. To further ensure GSX PL implements mitigation in order to protect the environment, public and private property, and ensure the pipeline is built safely and efficiently, the Panel makes the following recommendation.

Recommendation 23

The Panel recommends that GSX PL implement or cause to be implemented all of the policies, practices, recommendations, procedures, and commitments for the protection of the environment and the promotion of safety referred to in its Application, or as otherwise adduced in evidence before the Panel during the GH-4-2001 proceeding.

As the EPRPs and EAS are key field documents, the Panel expects that these will be further updated based on various commitments made to the Panel, Intervenors, and other government agencies during the course of the Panel review. The Panel also notes there are numerous recommendations made in GSX PL's environmental reports, and possibly information from subsequent reports that should be included in GSX PL's EPRPs and EAS. The EPRPs should contain all information on the record and commitments made in the proceeding for the protection of the environment. Therefore, the Panel recommends filing updated EPRPs and EAS prior to construction to ensure that all commitments, undertakings, or mitigation measures adduced in the GH-4-2001 proceeding are captured.

Recommendation 24

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of construction (which for the terrestrial portion of the pipeline means clearing of vegetation or ground-breaking activities and for the marine portion of the pipeline means the initiation of pipe lay operations) or within a time otherwise directed by the Board, updated copies of its Marine, Terrestrial, and Landfall Environmental Protection and Reclamation Plans (EPRPs) and Environmental Alignment Sheets that include all environmental commitments and site-specific mitigative measures made in respect of the Application. The Panel recommends that GSX PL implement the approved EPRPs.

The NEB would monitor GSX PL compliance with any conditions, and inspections and audits would be carried out by NEB Inspection Officers and specialized staff.

The Panel is of the view that GSX PL should be required to develop a detailed Project-specific environmental training program based on its EPRPs. All field staff should receive appropriate environmental training and an orientation to the Project prior to construction. GSX PL Inspectors, most notably the environmental inspectors, should receive detailed Project-specific training to assist in the implementation of the proposed mitigation measures and environmental compliance early in the process.

Recommendation 25

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of construction (which for the terrestrial portion of the pipeline means clearing of vegetation or ground-breaking activities and for the marine portion of the pipeline means the initiation of pipe lay operations) or within a time otherwise directed by the Board, a detailed outline of information related to environmental protection measures that will be presented to all field personnel during a project-specific environmental training program.

GSX PL committed to provide the NEB with Environmental As-Built Reports and post-construction monitoring reports for the terrestrial, landfall, and marine portions of the Project. The As-Built Report would be submitted following completion of construction and would contain a discussion of the effectiveness of mitigation measures implemented; as-built alignment sheets that identify what was done (e.g., where berms were placed, locations of trench breakers, crossing methodologies used, etc.); and a discussion of the status of any unresolved environmental issues, including a plan to address them.

Post-construction monitoring would be conducted beginning with the first calendar year following construction. A second monitoring program would be completed the second calendar year after construction. The purpose of the monitoring would be to: evaluate the effectiveness of final clean-up and reclamation measures; determine the status of any outstanding issues as identified in the Environmental As-Built Report; identify any new environmental issues that have arisen; and recommend and co-ordinate the implementation of required remedial measures or additional special measures to address outstanding or new environmental issues.

To identify outstanding environmental issues and ensure that GSX PL has a plan in place to adequately follow-up on and address the issues, and to receive an assessment of the effectiveness of mitigation measures undertaken on the pipeline ROW, the Panel concludes that detailed as-built and post-construction monitoring reports should be prepared to manage any residual environmental effects.

Recommendation 26

The Panel recommends that GSX PL file with the Board, within six months of the date that the facilities are placed into service, and on or before the 31 January that follows each of the first, second, and third complete growing seasons, a report that:

(a) identifies the status of any new or outstanding environmental issues for the terrestrial, landfall, and marine portion of the pipeline;

(b) provides a description of the measures GSX PL proposes to take in respect of any new or outstanding environmental issues;

(c) provides an assessment of the effectiveness of mitigation measures undertaken on the terrestrial landfall and marine pipeline ROW, including final clean-up and reclamation on the terrestrial and landfall portion of the ROW; and

(d) contains As-Built Alignment Sheets.

During operation of the pipeline, GSX PL would be required to comply with the NEB's *Onshore Pipeline Regulations, 1999* (OPR 99). Section 48 of the OPR 99 requires a company to develop and implement an environmental protection program (EPP) to anticipate, prevent, mitigate and manage conditions that have a potential to adversely affect the environment. An EPP would assist GSX PL in proactively managing environmental issues and systematically tracking its environmental performance. Sections 53 and 55 of the OPR 99 require a company to conduct regular audits and inspections of its EPP and to document any non-compliance and associated corrective actions.

14.2 Need for and Requirements of Follow-up

The Panel has considered the need for, and requirements of, follow-up in the environmental assessment. This need has been discussed throughout the Report in the appropriate sections. The specific areas of follow-up identified by the Panel include:

- benthic flora and fauna along Cape Keppel near ER 67;
- barrier effects to benthic fauna;
- reef effects; and
- rare plant species.

The Panel is of the view that the specific recommendations in the Report should allow GSX PL to further develop the follow-up programs early in the planning stages of the Project and to ensure their implementation.

The Panel expects GSX PL to further develop its follow-up programs and discuss them with the appropriate Responsible Authorities and Federal Authorities having jurisdiction and in possession of specialist or expert information or knowledge, with respect to the Project. The Panel recommends that GSX PL consult and work with appropriate stakeholders with specific expertise, such as eelgrass and marine mammal experts, in the development of the follow-up programs.

Specific recommendations in this Report related to follow-up programs would provide a mechanism to ensure that programs are sufficiently detailed and scientifically robust. Follow-up programs should:

- contain sufficient baseline information;
- be quantitative in nature and have statistical power;
- include a description of the mitigation to be implemented;
- include detailed descriptions of the monitoring methods, timing and duration of the study;
- contain reporting and success measurement criteria;
- be developed in consultation with appropriate stakeholders having specific expertise; and
- ensure appropriate consultation with the appropriate Responsible Authorities and Federal Authorities has been carried out.

Follow-up Programs

The following excerpts from the Agency's Operational Policy Statement provide guidance for federal authorities (FAs) and proponents in identifying the need for follow-up programs for environmental assessments conducted under the CEA Act.

Given that an EA may involve a certain degree of uncertainty with respect to the nature and extent of effects resulting from a project, including cumulative effects, follow-up can be an important tool to verify the accuracy of predictions and to address anticipated environmental effects.

Follow-up under the CEA Act is defined as:

"a program for verifying the accuracy of the environmental assessment of a project, and determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project."

Why a Follow-up Program?

- To aid in the detection of unanticipated environmental effects.
- To support or verify predictions made concerning the likelihood of "no significant environmental effects".

15. Public Comments

The Panel's Terms of Reference require it to consider comments received from the public during the review. Comments from the public were received during the review process in a variety of ways: through information provided by GSX PL; during the public consultation sessions in January 2002; via letters of comment; and through written and oral presentations at the hearing. Numerous comments were received on the potential environmental effects of the Project and the need for these effects to be mitigated effectively. These have been discussed in the relevant sections of this Report. In addition, the Panel received comments on a number of other matters. These included:

- economic viability of the pipeline;
- security of supply for the pipeline;
- consultation with First Nations;
- environmental effects of the combustion of gas to be transported by the pipeline;
- landowner compensation issues;
- concerns with the integrity of the existing Centra system to accommodate increased volumes of natural gas;
- the potential privatization of BC Hydro;
- regional taxation issues;
- the use of gas-fired generation facilities to generate electricity on Vancouver Island; and
- concerns with the public consultation process followed by GSX PL.

The Panel notes that the first four matters will be discussed in any Reasons for Decision issued pursuant to the NEB Act. However, the Panel is not authorized to make a decision under the NEB Act until after the Joint Review Panel Report under the CEA Act has been received by the Minister of the Environment and the government response to this Report has been received by the NEB.

The Panel notes that for issues with respect to compensation for landowners, the NEB Act does not provide for the involvement of either the Panel or the NEB in determining compensation for the use of land or for damage that results from the construction of the Project. These compensation claims are ultimately

handled by the Minister of Natural Resources Canada. However, the NEB Act does provide for negotiation and arbitration. Sections 88 and 89 set out the procedure for negotiation proceedings, and sections 90 through 103 set out the procedures for arbitration.[7]

The Panel was asked to include in its review the safety and design of the existing Centra system. The concerns expressed were that the existing system might not be able to withstand potential seismic events and that the Project would put additional strains on the existing system. As a result, the potential for pipeline accidents would be increased and the possible effects would be detrimental to residents of Vancouver Island and the environment.

"...the proposed new pipeline will be built to the most up-to-date standards. Unfortunately, it will connect to the already existing Centra pipeline which is a smaller-in-diameter pipeline, operating at a lower pressure, and built apparently without regard to seismic considerations. The GSX pipeline will put additional strains on the Centra pipeline increasing the possibility of environmental accident." ***Dorothy Field, January 2002, Presentation to the Panel***

A concern was identified with the potential for privatizing BC Hydro and the effects this would have on the security and cost of electrical supply to Vancouver Island residents. It was submitted to the Panel that privatization of the government-owned utility could result in higher electrical bills, and electrical supply problems similar to those experienced recently in California.

"I am suspicious of the partnership between BC Hydro and the Williams Corporation. If this alliance goes forward, it will be a windfall for the Williams shareholders, and a disaster for BC Hydro customers. There will be no need to privatize BC Hydro because it will have been privatized *ipso facto*. At present BC Hydro is responsible to the people of BC, including Vancouver Island. The Williams Corporation is responsible only to its shareholders. ... BC Hydro is like a birthright to future generations. Be careful so it is not sold for a mess of pottage." ***Charles Fox, January 2002, Presentation to the Panel.***

"The pipeline in question will not only contribute to the greenhouse emissions, but constitute the thin edge of the wedge to ultimately turn over B.C.'s public power to private interests, as all these hydro projects would be co-generation, in other words partnered with the industries that require the energy, and which would eventually own them as the new government seems hell bent on divesting itself of public operations." ***J.D. Williams, 29 November 2001, Letter of Comment***

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The appraisal and taxation of the Project in regional districts and municipalities was also identified as a concern.

> **"Given that a natural gas line represents millions of dollars in improvements to a Company, I would like to know what provisions are made for the appraisal and taxation of that infrastructure, where it passes through Regional Districts and Municipalities?"** ***Rodger Hamilton, January 2002, Presentation to the Panel***

The Panel wishes to provide additional details on the two remaining issues that were identified: specific concerns expressed by the public that relate to the Province of BC's decision to commit Vancouver Island to a fossil fuel strategy and concerns expressed about the public consultation process that was undertaken by GSX PL for the Project.

15.1 Committing to a Fossil Fuel Strategy

As discussed in section 2.2 of this Report, the purpose of the Project as scoped is to transport natural gas to Vancouver Island but the need for the gas is largely a function of the anticipated need for electricity on Vancouver Island. During the public consultation sessions, the oral hearing, and through letters of comment, the Panel heard thoughtful and concerned views from numerous parties about the future energy path for Vancouver Island. Intervenors and other members of the public were concerned that if the Project and VJGP become realities, Vancouver Island would be locked into a fossil fuel strategy for many years. It was submitted that the Project represented a fundamental shift in energy strategy for Vancouver Island.

> **"If we build the natural gas infrastructure now, then we will be committed to using this energy source instead of exploring the use of alternative energy sources for Vancouver Island. Although natural gas is cleaner than many conventional energy sources, it is still dependent on gas exploration and extraction, which is environmentally destructive in and of itself. As an island, Vancouver Island has a chance to become self sufficient in terms of energy, and this plan eliminates that option. The long term sustainability of the Island and of the planet should be considered as priorities for planning."** ***Claire Malcolmson, 12 December 2001, Letter of Comment***

Specific concerns associated with this change in energy strategy that were expressed included the validity of electricity demand projections, decommissioning of the existing subsea cable system, reduced investment in alternate energy forms, increased GHG emissions within Vancouver Island and the Province of BC with attendant climate changes, and decreased security of energy supply for Vancouver Island as the pipeline is routed through the US.

> **"I suggest that if that investment is made in that gas strategy, a GSX gas strategy, that huge investment being made, it will delay for years any significant investment in green energy alternatives on the Island and possibly even in BC."** ***(Mr. Skerik, JRP Hearing Transcript, 18 March 2003, Volume 16, Para 24835)***

The Panel notes that electricity demand projections would be discussed within the context of the economic viability of the pipeline in any Reasons for Decision under the NEB Act. The Panel also notes that VIGP, which is currently undergoing regulatory review by the BC Utilities Commission (BCUC), would need approximately 50 per cent of the gas to be transported by the Project. When questioned about what would happen to the Project if regulatory approval for VIGP was not received, GSX PL responded that the Project would be unlikely to proceed because there would be insufficient demand to sustain the pipeline. In response to a draft condition concerning regulatory approvals for VIGP, GSX PL did not object to the condition but requested that the wording be altered. This condition is outside the ambit of this Report and would need to be implemented under the NEB Act Certificate of Public Convenience and Necessity, if one is issued.

The Panel notes that the provincial government commitment to a fossil fuel strategy for Vancouver Island raised the ire of many individuals. They clearly presented their frustration with the provincial decision and said there was poor communication and little public involvement in a provincial policy decision that was seen as fundamental to individuals on Vancouver Island. Many of the parties expressed anger with the Project and denounced any need for it. They pointed out that there is no market for the gas from the pipeline other than the existing ICP and the proposed VIGP gas-fired generation facilities on Vancouver Island.

The combination of the Project and VIGP was viewed as inevitably causing the use of more gas while other options, such as the renewal of the existing subsea cables, did not necessarily require the use of more gas.

Furthermore, the use of natural gas to generate electricity was seen by some Intervenors and members of the public as having undesirable environmental effects, such as greenhouse gas emissions, when compared to other alternatives that could provide electricity on Vancouver Island. The Panel heard from many members of the public that other ways of meeting the need for electricity on Vancouver Island, such as coal bed methane, wind, solar and tidal power, and demand-side management should be considered.

A number of Intervenors and the public submitted that the preferred option for supplying electricity to Vancouver Island was the refurbishment or replacement of the existing subsea cables.

> **"The subsea cable alternatives on the other hand, should it be connected with fossil-fuel-free energy sources, would avoid this potential liability. And again, what this comes back to is that the cable alternative at least allows the possibility of fossil-fuel-free energy sources being used, whereas the pipeline is an irrevocable commitment to use gas-fired energy on Vancouver Island."** ***(GSXCCC, JRP Hearing Transcript, 18 March, 2003, Volume 16, Para. 24588)***

Some Intervenors pointed to the testimony of BC Hydro officials that the Provincial government directed BC Hydro to pursue Power Purchase Agreements with private developers who were proposing to generate electricity on Vancouver Island using natural gas. Subsequently, BC Hydro decided that gas-fired generation on Vancouver Island and a gas pipeline was the preferred alternative to the refurbishment or replacement of the subsea cables. GSXCCC referred to GSX PL's argument that the Project would not cause more greenhouse gas emissions than the cable renewal alternatives, because both the Project and the cable renewal options would depend on the equivalent gas-fired electrical generation facilities. GSXCCC argued that this claim could not be confirmed from the evidence on the record.

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> "Given that a natural gas line represents millions of dollars in improvements to a Company, I would like to know what provisions are made for the appraisal and taxation of that infrastructure, where it passes through Regional Districts and Municipalities?" *Rodger Hamilton, January 2002, Presentation to the Panel*

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"Not only has BC Hydro failed to produce information to show that the cost projection for the pipeline is reliable, it has failed to demonstrate that it has taken natural gas prices into account in determining whether or not a natural gas pipeline is a financially responsible choice as the determinant of choice of generating technology for Vancouver Island." ***(CAC BC, JRP Hearing Transcript, 17 March 2003, Volume 15 (Evening session), Para. 24289)***

A number of Intervenors were concerned about the price of natural gas and the potential for it to increase substantially. For example, CAC BC submitted that BC Hydro does not care how high the price of natural gas might go and whether or not natural gas remains a competitive alternative.

Concerns about Canadian natural gas being transported by the Project through Washington were raised during the public consultation meetings in January 2002. A number of Intervenors, including CAC BC, Dr. Fisher, GSXCCC, Ms. McLennan and Shadybrook Farm, expressed similar concerns. Ms. McLennan stated that the Project represents a betrayal of domestic energy consumers and that all forms of domestic energy should be fully Canadian owned, operated and transported. She also suggested that once gas is exported under NAFTA, the resource ownership door could never be closed again.

Mr. Campbell stated that under the Columbia River Treaty (originally signed in 1961 and expiring in 2024), Canada is entitled to a half share of the additional electricity, or Downstream Power Benefits, produced in the US from streamflow regulation provided in Canada. This regulation is provided by using the Treaty dams built at Mica, Arrow Lakes and Duncan. This share of the benefits is known as "the Canadian Entitlement". Under an agreement between the federal and provincial governments, the entitlement belongs to the Province of BC. The Province has the authority to decide whether its share of the downstream benefits should be physically returned to the Province or sold. Mr. Campbell, Mr. Marchant and Ms. McLennan argued that the Columbia River downstream benefits should be made available to BC Hydro for use in BC.

"In my opinion, this huge excess of electricity from the Columbia River downstream benefits should be made available to our BC Hydro for use here in British Columbia, as it was intended to be made available and as initiated by WAC Bennett and confirmed in our BC Hydro's info sheet of July 1990." ***(Mr. Campbell, JRP Hearing Transcript, 17 March 2003, Volume 15 (Day session), Para. 23783)***

The Panel has no jurisdiction over provincial energy policy decisions such as the provincially regulated subsea cable system, or the Canadian Entitlement under the Columbia River Treaty. The Panel has no statutory authority under the NEB Act to direct that the subsea cable system be refurbished, or to direct that the Canadian Entitlement be used to supply electricity to Vancouver Island. The mandate of the Panel is to consider the environmental effects of the Project under the CEA Act and determine if the Project is in the public convenience and necessity under the NEB Act.

"Basically, if there is a gas fired generation strategy planned for Vancouver Island we have a right and responsibility to look at the full strategy with all of its necessary and interconnected parts. It is frustrating and demoralizing to scatter the puzzle pieces in various bureaucratic processes forcing people and panels into blinkered reviews of bits of pipe here and pieces of turbine there." *Bernadette Wyton, January 2002, Presentation to the Panel*

It was clear to the Panel, however, that the perceived absence of a clear transparent process to incorporate public input into the Province's energy decisions has resulted in a high degree of frustration and anger for residents of Vancouver Island. Concerns regarding the provincial decision to use gas-fired electrical generation on Vancouver Island, and a genuine desire to be actively involved in such policy decisions, resulted in many parties seeking to use this panel review process as a substitute for a proper provincial process.[8] The Panel heard from many concerned individuals eager to share their views on the importance of the wise use of energy resources. While these matters are outside the Panel's mandate, the Panel is of the view that these concerns are important and should be shared with other Canadians and their governments. To that end, these concerns are conveyed in this Report in the hope that they will be read and considered by the Minister of the Environment and other provincial and federal government departments.

15.2 Public Consultation Process

One of the purposes of the CEA Act is to ensure there is an opportunity for public participation in the environmental assessment process. Similarly, the NEB requires an applicant to undertake an Early Public Notification (EPN) program. The purpose of this program is to inform the public about a project, to seek public input into the route selection, environmental assessment and socio-economic impact assessment, to identify issues and concerns of those potentially affected by a project and to resolve issues in the early stages of a project.

GSX PL undertook an EPN and public involvement program that provided opportunities for interested parties to participate at three distinct steps before the Project entered into the Panel review process. These steps included Project introduction, corridor selection, and route identification and refinement. GSX PL stated that its public involvement program is ongoing and provided documentation to that effect. Activities undertaken by GSX PL include:

- identifying interested parties and developing and maintaining a contact mailing list;
- developing and distributing Project information materials including: Project backgrounder; seven Project info sheets; three Project update newsletters to approximately 13,000 individuals each time; press releases; and development and maintenance of an internet website;
- setting-up and monitoring of a toll-free telephone number and an e-mail address;
- maintaining document repositories for public registry materials;
- advertising Project information in newspapers, open houses and public information sessions; distributing notification flyers regarding Project and public events;

[8] The Panel notes that many of the issues identified by Intervenors regarding the suitability of gas-fired electrical generation on Vancouver Island are being raised, and considered, at the BCUC hearing for the proposed VIGP facility at Duke Point, which commenced following the end of final argument in the Panel's oral hearing.

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- meetings and discussions with representatives and elected officials of federal and provincial government agencies as well as municipal and regional governments, First Nations, resource industry associations (e.g., fishing and agriculture), environmental interest groups and other non-governmental organizations, and property owners and tenants affected by the route;
- hosting 21 community events including 16 open houses/public information sessions and five drop-in information centres;
- a separate involvement and consultation process for First Nations recognizing the specific needs and interests of First Nations and including the provision of capacity funding;
- responding to public and media requests for information; and
- recording of public input and identification of issues.

GSX PL stated that a key objective of its public involvement program was to raise public awareness of the Project by informing those who may be affected and providing them with a variety of opportunities for input. Comments on concerns and issues regarding the terrestrial and marine portions of the Project, the evaluation criteria, the type and scope of proposed studies, the pipeline corridor and landing point options on Vancouver Island were actively solicited. GSX PL requested, and considered, suggestions for measures to minimize or mitigate any potential adverse effects. Furthermore, GSX PL believes the Project design has benefited from local knowledge on environmental and socio-economic features of the study area.

GSX PL's public involvement program was fundamental to the identification of issues and concerns related to the Project, and GSX PL stated it has responded to these concerns through discussions, Project modifications, and the development of appropriate mitigation measures. For example, as a result of stakeholder concerns, GSX PL made route modifications, changes to the engineering design, developed further mitigation measures and integrated environmental considerations into the Project, as well as modified its contingency and emergency response planning processes.

GSX PL stated that its public involvement program is ongoing with stakeholders, including landowners, government and non-government organizations, and First Nations. Activities will include notification, consultation and follow-up to questions and requests for information; obtaining all necessary government authorizations, licences, and permits; implementing monitoring and maintenance programs; and ensuring that contingency and emergency response planning is effectively carried out.

> **"And one of my concerns in this project is that the wider public basically has been told. They have not been consulted. And because the project structure is such that mitigation only applies to those directly impacted, the wider public is left out in the cold."** ***(Ms. McLennan, JRP Hearing Transcript, 17 March 2003, Volume 15 (Evening session), Para 24045)***

Some Intervenors, including Ms. McLennan and Shadybrook Farm, were highly critical of GSX PL's public consultation process. Ms. McLennan stated that the Proponent has been unable to distinguish information from consultation. In her view, if consultation had been carried out, GSX PL would have been in a position to understand that from the public's perspective, this proposal should never have got off the ground.

Examples given by Shadybrook Farm of a poor consultation process included notification of landowners following, not preceding, initial public meetings; public meetings organized as show-and-tells rather than for dialogue;

arrogance shown by BC Hydro officials who believed they possessed knowledge superior to that of informed members of the public; advertising programs containing a heavy spin component; inaccurate information or half-truths that, in some cases, might verge on propaganda; and presentations to regional, municipal and even provincial government members that contained inaccuracies and half-truths.

GSX PL took exception to Intervenors' statements that its public consultation process was deficient and badly mishandled. GSX PL stated that it is proud of the public consultation program that it has carried out and believes it developed an excellent Project; in fact, a Project that is all the better because of the public consultation that was undertaken. GSX PL noted that VIPLA, whose members are the people who are most directly impacted by this pipeline, are saying that they are appreciative of GSX PL's cooperation in addressing their concerns.

> **"Let me read to you from VIPLA's letter of February 24, 2003. It's Exhibit C-39-20. VIPLA's counsel says this:**
>
> **'As you are aware from VIPLA's Information Request and Pre-filed Evidence, GSX's proposed pipeline construction raised many issues for landowners. VIPLA landowners are pleased with this settlement and are appreciative of GSX's cooperation in addressing their concerns.'" *(GSX PL JRP Hearing Transcript, 19 March 2003, Volume 17, Para. 25621 and 25622)***

GSX PL stated that those who oppose a project often complain about the consultation process.

During the course of the proceeding, some First Nations raised concerns about the impact the Project would have on the environment within their traditional territory. GSX PL continued to meet with these First Nations and during the oral hearing the Panel was informed that they had reached agreement with GSX PL and that their concerns had been substantially addressed.

The Panel is of the view that public participation strengthens the quality and credibility of environmental assessments. It is an important source of local and traditional knowledge about a project's physical site and likely environmental effects. Through the participation of interested parties, concerns that people have about a project can be identified and addressed at an early stage. Public participation also helps build a consensus among different stakeholders about a project's likely environmental effects and the most effective mitigation measures.

The Panel takes note of the strong remarks and feelings expressed by some Intervenors on what they saw as deficiencies of GSX PL's public consultation process. The Panel notes that project information is generally provided in a variety of ways (e.g., personal notice, public flyer, newspaper advertisement and open houses). This information can be interpreted in many ways, whether positive or negative. An individual's understanding of the consultation process, and their views on the appropriate time to provide specific information, will vary.

The Panel's decision to set the hearing date did not imply that the Panel was satisfied that all issues had been fully addressed at that time. Rather it meant that GSX PL had provided sufficient information to proceed with the public review process. There are a number of steps in this process that lead to the collection and dissemination of additional information. For example, the Information Request (IR) process is a mechanism by which the Panel and Intervenors question and clarify issues that might not have been fully addressed in the Application. Applications do not ordinarily contain all of the details of a proposed project and it is normal for the Panel and Intervenors to use the IR process to explore

- meetings and discussions with representatives and elected officials of federal and provincial government agencies as well as municipal and regional governments, First Nations, resource industry associations (e.g., fishing and agriculture), environmental interest groups and other non-governmental organizations, and property owners and tenants affected by the route;
- hosting 21 community events including 16 open houses public information sessions and five drop-in information centres;
- a separate involvement and consultation process for First Nations recognizing the specific needs and interests of First Nations and including the provision of capacity funding;
- responding to public and media requests for information; and
- recording of public input and identification of issues.

GSX PL stated that a key objective of its public involvement program was to raise public awareness of the Project by informing those who may be affected and providing them with a variety of opportunities for input. Comments on concerns and issues regarding the terrestrial and marine portions of the Project, the evaluation criteria, the type and scope of proposed studies, the pipeline corridor and landing point options on Vancouver Island were actively solicited. GSX PL requested, and considered, suggestions for measures to minimize or mitigate any potential adverse effects. Furthermore, GSX PL believes the Project design has benefited from local knowledge on environmental and socio-economic features of the study area.

GSX PL's public involvement program was fundamental to the identification of issues and concerns related to the Project, and GSX PL stated it has responded to these concerns through discussions, Project modifications, and the development of appropriate mitigation measures. For example, as a result of stakeholder concerns, GSX PL made route modifications, changes to the engineering design, developed further mitigation measures and integrated environmental considerations into the Project, as well as modified its contingency and emergency response planning processes.

GSX PL stated that its public involvement program is ongoing with stakeholders, including landowners, government and non-government organizations, and First Nations. Activities will include notification, consultation and follow-up to questions and requests for information; obtaining all necessary government authorizations, licences, and permits; implementing monitoring and maintenance programs; and ensuring that contingency and emergency response planning is effectively carried out.

> "And one of my concerns in this project is that the wider public basically has been told. They have not been consulted. And because the project structure is such that mitigation only applies to those directly impacted, the wider public is left out in the cold." *(Ms. McLennan, JRP Hearing Transcript, 17 March 2003, Volume 15 (Evening session), Para 24045)*

Some Intervenors, including Ms. McLennan and Shadybrook Farm, were highly critical of GSX PL's public consultation process. Ms. McLennan stated that the Proponent has been unable to distinguish information from consultation. In her view, if consultation had been carried out, GSX PL would have been in a position to understand that from the public's perspective, this proposal should never have got off the ground.

Examples given by Shadybrook Farm of a poor consultation process included notification of landowners following, not preceding, initial public meetings; public meetings organized as show-and-tells rather than for dialogue;

arrogance shown by BC Hydro officials who believed they possessed knowledge superior to that of informed members of the public; advertising programs containing a heavy spin component; inaccurate information or half-truths that, in some cases, might verge on propaganda; and presentations to regional, municipal and even provincial government members that contained inaccuracies and half-truths.

GSX PL took exception to Intervenors' statements that its public consultation process was deficient and badly mishandled. GSX PL stated that it is proud of the public consultation program that it has carried out and believes it developed an excellent Project; in fact, a Project that is all the better because of the public consultation that was undertaken. GSX PL noted that VIPLA, whose members are the people who are most directly impacted by this pipeline, are saying that they are appreciative of GSX PL's cooperation in addressing their concerns.

> "Let me read to you from VIPLA's letter of February 24, 2003. It's Exhibit C-39-20. VIPLA's counsel says this:
>
> 'As you are aware from VIPLA's Information Request and Pre-filed Evidence, GSX's proposed pipeline construction raised many issues for landowners. VIPLA landowners are pleased with this settlement and are appreciative of GSX's cooperation in addressing their concerns.'" *(GSX PL JRP Hearing Transcript, 19 March 2003, Volume 17, Para. 25621 and 25622)*

GSX PL stated that those who oppose a project often complain about the consultation process.

During the course of the proceeding, some First Nations raised concerns about the impact the Project would have on the environment within their traditional territory. GSX PL continued to meet with these First Nations and during the oral hearing the Panel was informed that they had reached agreement with GSX PL and that their concerns had been substantially addressed.

The Panel is of the view that public participation strengthens the quality and credibility of environmental assessments. It is an important source of local and traditional knowledge about a project's physical site and likely environmental effects. Through the participation of interested parties, concerns that people have about a project can be identified and addressed at an early stage. Public participation also helps build a consensus among different stakeholders about a project's likely environmental effects and the most effective mitigation measures.

The Panel takes note of the strong remarks and feelings expressed by some Intervenors on what they saw as deficiencies of GSX PL's public consultation process. The Panel notes that project information is generally provided in a variety of ways (e.g., personal notice, public flyer, newspaper advertisement and open houses). This information can be interpreted in many ways, whether positive or negative. An individual's understanding of the consultation process, and their views on the appropriate time to provide specific information, will vary.

The Panel's decision to set the hearing date did not imply that the Panel was satisfied that all issues had been fully addressed at that time. Rather it meant that GSX PL had provided sufficient information to proceed with the public review process. There are a number of steps in this process that lead to the collection and dissemination of additional information. For example, the Information Request (IR) process is a mechanism by which the Panel and Intervenors question and clarify issues that might not have been fully addressed in the Application. Applications do not ordinarily contain all of the details of a proposed project and it is normal for the Panel and Intervenors to use the IR process to explore

different subjects. Similarly, the Panel notes that Intervenors and GSX PL participated in the Marine Technical Conference. This was another process for information gathering related to very technical issues. Furthermore, the Panel notes that while project information is publicly available, some corporate information is proprietary and therefore remains confidential. Other information that may be requested by Intervenors may not be pertinent to the matter in front of the Panel. The Panel is aware that an individual or organization may be opposed to, or frustrated by, the public consultation process chosen by an applicant. This frustration can lead them to believe that their concerns were not fully alleviated or addressed. In fact, the Panel has given due consideration to all concerns raised throughout this proceeding.

16. Conclusions and Recommendations

16.1 Conclusions

The Panel was appointed as a joint review panel under the CEA Act to make recommendations to the Minister of the Environment and as a NEB panel under the NEB Act to consider all matters relevant to the application for a Certificate. Pursuant to the CEA Act, the Panel was charged with reviewing the environmental effects of the Project and the appropriate mitigation measures and setting out its rationale, conclusions and recommendations, including any mitigation measures and follow-up programs in the Joint Review Panel Report.

This Report reflects the Panel's review of the environmental effects of the Project and appropriate mitigation measures based on the Project description, factors considered during the review, and the scope of the factors. Throughout the Report, the Panel has made a number of recommendations that would ensure that appropriate mitigation would be implemented. The Panel was also charged with considering a proposal for contingency and emergency response plans, as well as considering any measures that would enhance beneficial environmental effects. Measures that would enhance beneficial environmental effects are also discussed in the relevant sections of the Report. For example, these include possible habitat compensation plans and increased forest habitat openings that would be beneficial to some rare plants. Contingency and emergency response plans are described in the relevant sections of the Report.

Provided all environmental commitments made by GSX PL in its application and undertakings during the GH-4-2001 proceeding are implemented, as well as the Panel's recommendations are implemented, the Panel concludes that the Project is not likely to result in significant adverse environmental effects. Therefore, the Panel recommends that the Project be allowed to proceed to regulatory and departmental decision making as long as the recommendations in this Report are made part of the requirements of any approval by the NEB.

16.2 Recommendations

Recommendation 1

The Panel recommends that GSX PL complete all outstanding pre-construction surveys, not referenced in any other condition, for the terrestrial and marine portions of the pipeline as committed to during the GH-4-2001 proceeding and file the results with the Board for approval 60 days prior to the commencement of construction, including clearing or ground-breaking activities and marine pipe lay operations. The filing shall identify any potential adverse effects and any additional mitigative measures to be implemented.

Recommendation 2

The Panel recommends that GSX PL file with the Board for approval, 60 days prior to initiating the horizontal directional drill (HDD) at the Manley Creek landfall, a detailed site-specific environmental management plan. The plan should:

(a) identify the potential hazards that could occur;

(b) identify all site-specific mitigation, habitat compensation, and monitoring requirements as required by Fisheries and Oceans Canada and Environment Canada;

(c) identify additional containment systems (e.g., booms and seafloor control devices) that would be used to minimize the potential for mud releases beyond the limits of the glory hole;

(d) specify that density adjustments to the drilling mud would only be made through the use of inert or non toxic materials;

(e) discuss and include any mitigation for launching the HDD pipe string; and

(f) include a monitoring plan to quantify the effects of drilling mud on marine vegetation at the HDD site.

Recommendation 3

The Panel recommends that GSX PL not implement the open cut or partial horizontal directional drill (HDD) method as an alternative to the proposed HDD at Manley Creek until:

(a) GSX PL files with the Board detailed reasons why the HDD is not feasible or was not successful;

(b) GSX PL consults with Environment Canada and Fisheries and Oceans Canada, obtains all necessary permits and files a detailed site-specific, open cut or partial HDD crossing plan and an eelgrass monitoring plan that includes scaled drawings identifying all areas that would be disturbed by constructing the crossing; and

(c) receives written approval from the Board that an open cut or partial HDD crossing may begin.

Recommendation 4

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of marine pipe lay operations, a detailed pre- and post-construction monitoring and follow-up program. The plan shall include scientifically rigorous criteria to be used to verify the accuracy of the environmental assessment predictions and to assess the effectiveness of the mitigation developed for benthic flora and fauna along Cape Keppel near Ecological Reserve 67. Copies of all correspondence and minutes of meetings demonstrating consultation in developing the plan with appropriate regulatory agencies, including Fisheries and Oceans Canada, shall be provided. The follow-up program will include a schedule for filing reports to the Board.

Recommendation 5

Should the jetting construction method be considered for the marine portion of the pipeline, the Panel recommends GSX PL file

with the Board for approval, at least 60 days prior to the commencement of marine pipe lay operations, the results of a specific sediment sampling plan for areas of the pipeline considered for installation using the jetting construction method. This report should include:

(a) a detailed statistically valid sampling protocol;

(b) the results of the sediment sampling plan, indicating whether sediment in excess of Environment Canada's (2000) Interim Contaminant Testing Guidelines is discovered;

(c) all mitigative measures GSX PL would implement should it be found that sediment in excess of Environment Canada's (2000) Interim Contaminant Testing Guidelines exists in the area that could be affected by the project;

(d) copies of all correspondence and minutes of meetings demonstrating consultation in developing the plan and mitigative measures with appropriate regulatory agencies, including Environment Canada and Fisheries and Oceans Canada; and

(e) criteria to verify the accuracy of the environmental assessment predictions and to assess the effectiveness of the mitigation.

Recommendation 6

The Panel recommends GSX PL file with the Board for approval, at least 60 days prior to the commencement of marine pipe lay operations, a follow-up program to verify the accuracy of the environmental assessment predictions in relation to reef effects. Copies of all correspondence and minutes of meetings demonstrating consultation in developing the program with appropriate regulatory agencies, including Environment Canada and Fisheries and Oceans Canada, shall be provided. The follow-up program shall include a schedule for filing reports to the Board.

Recommendation 7

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of marine pipe lay operations, a follow-up program on barrier effects. The follow-up program include:

(a) a schedule for filing subsequent reports with the Board which verify the accuracy of the environmental assessment predictions and assess the effectiveness of the mitigation developed for reducing barrier effects to benthic communities and include any further mitigation proposed by GSX PL;

(b) copies of all correspondence and minutes of meetings demonstrating consultation with appropriate stakeholders, including, but not limited to, Environment Canada, and Fisheries and Oceans Canada, in developing the follow-up program;

(c) a detailed approach to ensure that, in areas where the pipeline is trenched, a minimum of 50 per cent of its diameter for no less than 50 per cent of each 100 m linear section will be buried; and

(d) an outline and schedule of the reports to be submitted on the results of year 1, 2, 3 and 5 post-construction crab trapping and tagging studies, and year 7 if deemed necessary by Fisheries and Oceans Canada and the reports shall include any further mitigation proposed by GSX PL.

Recommendation 8

The Panel recommends that GSX PL take all reasonable measures to construct the marine portion of the pipeline from October to April to minimize potential interactions with marine mammals. Should GSX PL determine that it is necessary for construction to extend beyond April, GSX PL shall file with the Board for approval at least 30 days prior to 30 April:

(a) information on the status of marine construction activities and an updated construction schedule, including the anticipated completion date;

(b) specific mitigation and monitoring plans that may be undertaken by GSX PL for construction activities outside the window; and

(c) copies of all correspondence and minutes of meetings demonstrating consultation in developing the plans with appropriate regulatory agencies, including Fisheries and Oceans Canada.

Recommendation 9

The Panel recommends that GSX PL file a report setting out the results of its post-construction sound emission study with the Board for approval within 90 days of commencement of operation of the pipeline. The report shall include data gathered on sound emitted from the marine pipeline for the representative range of flow, pressure, compressor operating conditions and any other factor that may contribute to the sound emissions. Data should establish the level of sound emitted from the pipeline in relation to ambient noise levels and the distance this sound is propagated in the water column. Should the test results indicate that pipeline noise would be detectable to killer whales and harbour porpoises, GSX PL shall consult with Fisheries and Oceans and include in the report any additional mitigation measures it plans to implement to reduce the noise level.

Recommendation 10

The Panel recommends that GSX PL file for approval with the Board, at least 60 days prior to the commencement of clearing of vegetation or ground-breaking activities, a report outlining the plan to test groundwater encountered during excavation for sewage constituents. The report shall:

(a) include a statement of the type of testing methodology to be used;

(b) indicate the sewage constituents to be tested for;

(c) include the acceptable levels of each constituent;

(d) provide the frequency of testing; and

(e) provide a mitigation and disposal plan for water found to exceed the acceptable limits.

Recommendation 11

The Panel recommends that GSX PL file for approval with the Board, at least 60 days prior to the commencement of clearing of vegetation or ground-breaking activities, a report outlining the plan to test wells 18200, 27402, 28298 and 29881 for yield and water quality prior to, during and after the HDD construction. The report shall:

(a) include a statement of the type of testing methodology to be used;

(b) include the acceptable water quality level and well yield;

(c) provide the frequency of testing;

(d) include the duration of testing after the HDD construction; and

(e) provide for any additional mitigative measures that would be implemented.

Recommendation 12

The Panel recommends that GSX PL file for approval with the Board, at least 60 days prior to the commencement of clearing of vegetation or ground-breaking activities, a report outlining a testing plan to ensure that, upon backfilling and compaction, trench backfill material has permeability properties consistent with the surrounding soils. The report shall:

(a) include pre-construction in-situ field testing;

(b) include the infiltration test procedure to be used;

(c) provide the criteria for determination of acceptable permeability range limits relative to existing conditions;

(d) provide the frequency of testing; and

(e) include a mitigation plan if permeability is found to be outside acceptable limits.

Recommendation 13

The Panel recommends that GSX PL offer to conduct, for those landowners with wells located within 50 m of the pipeline ROW and within 300 m of blasting activities, detailed pre-construction water well analyses to acquire baseline information about water quality and well function including yield. Following completion of construction activities, GSX PL shall offer to conduct additional water well monitoring and analyses, for those landowners who agreed to pre-construction analyses, to confirm no adverse effects. If the analyses demonstrate an effect (deterioration in water quality or well yield) on a specific water well due to GSX PL's activities, it shall undertake corrective action to address any effects. GSX PL shall document and respond to any complaints received concerning water quality or well function for two years following construction. GSX PL shall file with the Board within 14 days of receiving the complaint, a summary of the issue and a discussion of its resolution, or a proposed action plan.

Recommendation 14

The Panel recommends that GSX PL offer to conduct, for those landowners with inhabited structures within 50 m of the pipeline ROW, detailed pre-blast structural assessments. Following construction, GSX PL shall offer to conduct post-blast structural assessments, for those landowners who agreed to pre-blast structural assessments. If the assessments demonstrate an effect on a specific inhabited structure due to GSX PL's activities, it shall undertake corrective action to address any effects. GSX PL shall document and respond to any complaints received concerning blasting effects on inhabited structures for two years following construction. GSX PL shall file with the Board within 14 days of receiving the complaint, a summary of the issue and a discussion of its resolution, or a proposed action plan.

Recommendation 15

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of construction (which for the terrestrial portion of the pipeline means clearing of vegetation or ground-breaking activities and for the marine portion of the pipeline means the initiation of pipe lay operations) or within a time otherwise directed by the Board, the qualifications and experience of the Environmental Inspectors and Soil Specialist(s) who will be used on the Project.

Recommendation 16

The Panel recommends that GSX PL file with the Board, at least 21 days prior to the commencement of clearing of vegetation or ground-breaking activities, the methodology and results of a pre-construction survey for federally and provincially listed plant species of concern along the entire terrestrial portion of the ROW. Where plant species of concern could be affected by construction activities, GSX PL shall also file a detailed mitigation plan for approval, including copies of all correspondence and minutes of meetings demonstrating consultation in developing the plan with appropriate regulatory agencies, including Environment Canada.

Recommendation 17

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of clearing of vegetation or ground-breaking activities, a follow-up program to verify the accuracy of the environmental assessment predictions and to assess the effectiveness of the mitigation developed for snow-white rein orchid, slender woolly heads, California-tea, and any other federally and provincially listed plant species of concern discovered during the pre-construction surveys. Copies of all correspondence and minutes of meetings demonstrating consultation in developing the program with appropriate regulatory agencies, including Environment Canada, shall be provided. The follow-up program shall include a schedule for filing reports with the Board.

Recommendation 18

The Panel recommends that GSX PL file with the Board, at least 21 days prior to the commencement of clearing of vegetation or ground-breaking activities, the results of an additional detailed breeding bird survey to determine the presence of active nests of breeding birds within 100 m of areas to be disturbed during construction. Where active nests of breeding birds are observed, GSX PL shall also file a detailed mitigation plan for approval, including copies of all correspondence and minutes of meetings demonstrating consultation with appropriate regulatory agencies, including Environment Canada, in developing the plan.

Recommendation 19

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of clearing of vegetation or ground-breaking activities or within a time otherwise directed by the Board, a heritage resource impact assessment, including any additional mitigation measures, for the portions of the ROW not previously surveyed. The filing shall also include any comments and recommendations on this assessment and proposed mitigation from the British Columbia Ministry of Sustainable Resource Management, Archaeology Branch, with a statement on whether GSX PL intends to implement the recommendations.

Recommendation 20

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of HDD operations or marine pipe lay operations whichever is sooner, or within a time otherwise directed by the Board, any comments and recommendations on the underwater archaeological assessment and the proposed mitigation from the British Columbia Ministry of Sustainable Resource Management, Archaeology Branch, and a statement on whether GSX PL intends to implement the recommendations.

Recommendation 21

The Panel recommends that GSX PL cause the approved facilities to be designed, manufactured, located, constructed, installed and operated in accordance with those specifications, drawings, schedules, and other information or data set forth in its Application or as otherwise adduced in evidence before the Panel during the GH-4-2001 proceeding.

Recommendation 22

The Panel recommends that GSX PL maintain at its construction office(s):

(a) copies of any permits, approvals or authorizations for the applied-for facilities issued by federal, provincial or other permitting agencies, which include environmental conditions or site-specific mitigative or monitoring measures; and

(b) any subsequent variations to any permits, approvals or authorizations.

Recommendation 23

The Panel recommends that GSX PL implement or cause to be implemented all of the policies, practices, recommendations, procedures, and commitments for the protection of the environment and the promotion of safety referred to in its Application, or as otherwise adduced in evidence before the Panel during the GH-4-2001 proceeding.

Recommendation 24

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of construction (which for the terrestrial portion of the pipeline means clearing of vegetation or ground-breaking activities and for the marine portion of the pipeline means the initiation of pipe lay operations) or within a time otherwise directed by the Board, updated copies of its Marine, Terrestrial, and Landfall Environmental Protection and Reclamation Plans (EPRPs) and Environmental Alignment Sheets that include all environmental commitments

and site-specific mitigative measures made in respect of the Application. The Panel recommends that GSX PL implement the approved EPRPs.

Recommendation 25

The Panel recommends that GSX PL file with the Board for approval, at least 60 days prior to the commencement of construction (which for the terrestrial portion of the pipeline means clearing of vegetation or ground-breaking activities and for the marine portion of the pipeline means the initiation of pipe lay operations) or within a time otherwise directed by the Board, a detailed outline of information related to environmental protection measures that will be presented to all field personnel during a project-specific environmental training program.

Recommendation 26

The Panel recommends that GSX PL file with the Board, within six months of the date that the facilities are placed into service, and on or before the 31 January that follows each of the first, second, and third complete growing seasons, a report that:

(a) identifies the status of any new or outstanding environmental issues for the terrestrial, landfall, and marine portion of the pipeline;

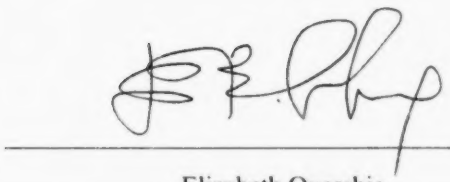
(b) provides a description of the measures GSX PL proposes to take in respect of any new or outstanding environmental issues;

(c) provides an assessment of the effectiveness of mitigative measures undertaken on the terrestrial, landfall and marine pipeline ROW, including final clean-up and reclamation on the terrestrial and landfall portion of the ROW; and

(d) contains As-Built Alignment Sheets.

Joint Review Panel Report

GSX Canada Pipeline Project



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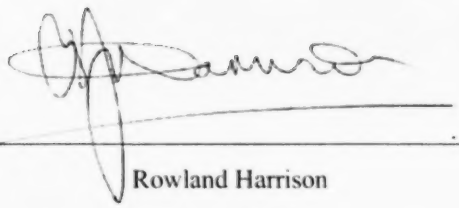
Joint Review Panel Chair



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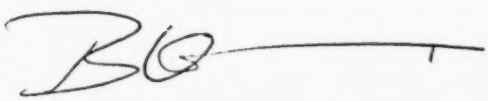
Member



The Honourable Bryan Williams, Q.C.

Member

Appendices

Appendix A Agreement Establishing the Joint Review Panel

Appendix B Panel Member Biographies

Appendix C Hearing Order / Directions on Procedure

Appendix D Panel Rulings

Appendix E List of Intervenors

Appendix F List of Abbreviations

Appendix G Public Consultation by the Panel

Appendix H Acknowledgements

Appendix A

Agreement Establishing the Joint Review Panel

AGREEMENT BETWEEN THE NATIONAL ENERGY BOARD AND THE MINISTER OF THE ENVIRONMENT CONCERNING REVIEW OF THE GSX CANADA PIPELINE PROJECT

August 15, 2001

PREAMBLE

WHEREAS the National Energy Board (the Board) has statutory responsibilities pursuant to the National Energy Board Act (the NEBA) and for environmental assessment pursuant to the NEBA and the Canadian Environmental Assessment Act (the CEAA);

WHEREAS the Minister of the Environment has statutory responsibilities pursuant to the CEAA;

WHEREAS an application for a Certificate of Public Convenience and Necessity was filed with the Board pursuant to Part III of the NEBA by Georgia Strait Crossing Pipeline Limited on April 24, 2001 in respect of the GSX Canada Pipeline project (the Project), the Canadian component of a new international pipeline referred to as the Georgia Strait Crossing Project;

WHEREAS the Project is within the jurisdiction of the Board under the NEBA and requires an environmental assessment pursuant to the CEAA;

WHEREAS the Board has established processes under the NEBA for assessment of project proposals including the environmental effects of projects within its jurisdiction;

WHEREAS the Project requires a public regulatory hearing pursuant to the NEBA;

WHEREAS the Board has referred the Project to the Minister of the Environment for a referral to a review panel in accordance with paragraph 21(b) of the CEAA;

WHEREAS the Parties to this Agreement wish to avoid unnecessary duplication that could arise from carrying out the environmental assessment requirements under the CEAA and the NEBA;

WHEREAS the Minister of the Environment has determined that a Joint Review Panel should be established pursuant to paragraph 40(2)(a) of the CEAA to consider the Project;

WHEREAS the Parties agree to co-operate and co-ordinate the environmental assessment of the Project by means of a Joint Review Panel process to ensure adherence to the requirements of both the CEAA and the NEBA;

WHEREAS the CEAA requires responsible authorities to co-operate and co-ordinate their duties and obligations under the CEAA;

WHEREAS the Board has carried out an initial scoping process for the environmental assessment and comments from the public and other federal authorities have been solicited and received; and

WHEREAS the Parties are aware of and acknowledge the ongoing review of the GSX US Pipeline project before the United States Federal Energy Regulatory Commission which will involve a public participation process in the United States of America;

NOW THEREFORE, the Parties agree to undertake to establish a Joint Review Panel, as outlined below and in accordance with the Terms of Reference attached as an Appendix to this Agreement, for the environmental assessment of the Project as described in the Project Description.

1. DEFINITIONS

In this Agreement:

"**Agency**" means the Canadian Environmental Assessment Agency;

"**Board**" means the National Energy Board;

"**Board's Procedures**" means the National Energy Board Rules of Practice and Procedure, 1995, as amended and made pursuant to section 8 of the NEBA;

"**Board's Public Hearing Process**" means the public hearing process followed by the Board under the NEBA to assess a proposed project and the environmental effects of a project;

"**CEAA**" means the Canadian Environmental Assessment Act;

"**Environment**" has the same meaning as set out in section 2 of the CEAA;

"**Environmental Effect**" has the same meaning as set out in section 2 of the CEAA;

"**Federal Authority**" has the same meaning as set out in section 2 of the CEAA;

"**Follow-up Program**" has the same meaning as set out in section 2 of the CEAA;

"**Intervenor**", as defined in the Board's Procedures, means a person who establishes an interest in a proceeding by filing a written intervention in accordance with the Board's Procedures;

"**Joint Review Panel**" means a joint review panel established pursuant to section 4 of this Agreement;

"**Joint Review Panel Report**" means the report set out in section 4.4 of this Agreement;

"**Jurisdiction**" has the same meaning as set out in subsection 40(1) of the CEAA;

"**Letter of Comment**" means a letter as referred to in section 30 of the Board's Procedures and means an unsworn written or oral submission that comments on the Project or on any issue related to the Review, that describes the nature of that submittor's interest in the Project and provides any relevant information explaining or supporting the submittor's comments. It does not give the submittor an Intervenor status in the review so the submittor cannot cross-examine witnesses or present final argument. Similarly, the submittor of a "Letter of Comment" is not subject to cross-examination;

"**NEBA**" means the National Energy Board Act;

"**Parties**" means the signatories to this Agreement;

"**Pipeline**" has the same meaning as set out in section 2 of the NEBA;

"**Project**" means the project as described in Part I of the Appendix to this Agreement, and may also be referred to as the GSX Canada Pipeline project;

"**Project Description**" means the description referred to in Part I of the Appendix to this Agreement;

"**Proponent**" means Georgia Strait Crossing Pipeline Limited;

"**Public Registry**" means the registry established under section 55 of the CEAA, to facilitate public access to records relating to the environmental assessment of the Project;

"**Responsible Authority**" has the same meaning as set out in section 2 of the CEAA; and

"**Review**" means the assessment of the environmental effects of the Project to be conducted pursuant to the CEAA and the consideration of the Project application under the NEBA.

2. GENERAL

2.1 The primary purpose of this Agreement is to coordinate the environmental assessment required under the CEAA and the NEBA by providing for a Review of the environmental effects likely to result from the Project and the appropriate mitigation measures. Nothing in this agreement shall be construed as limiting the ability of the Joint Review Panel to have regard to all considerations that appear to it to be relevant pursuant to section 52 of the NEBA.

2.2 Co-ordinating Responsible Authority - The Board will act as the co-ordinating Responsible Authority, with respect to its involvement as a Responsible Authority, with other Responsible Authorities in relation to the Project.

2.3 Public Registry - As part of the Review, a Public Registry will be maintained in accordance with the requirements of the CEAA.

2.4 Participant Funding Program - Participant funding for matters and issues relating to the CEAA will be arranged for the Review and will be administered and managed by the Agency. The public will be provided with a minimum of 60 days to apply for funding under the program and will be notified of any funding allocation once the list of Intervenors has been established.

3. REVIEW UNDER A JOINT REVIEW PANEL PROCESS

3.1 Terms of Reference - The Joint Review Panel will conduct a Review of the Project in accordance with the Terms of Reference attached as an Appendix to this Agreement.

3.2 Joint Review Panel Responsibilities - The Joint Review Panel will act as a joint review panel under the CEAA to make recommendations and as a Board panel under the NEBA to determine all matters relevant to the applications respecting the Project and falling within the Board's jurisdiction under the NEBA, the CEAA, and the Terms of Reference. The Review will meet the requirements under the CEAA and the NEBA.

3.3 Powers of the Joint Review Panel - The Joint Review Panel, when appointed, will issue Directions on Procedure in accordance with the Board's Procedures and the procedures outlined in article 4.3 of this Agreement. The Joint Review Panel will have the powers set out in the NEBA and section 35 of the CEAA.

4. PROCEDURES FOR JOINT REVIEW PANEL

4.1 Joint Review Panel Composition and Appointment
The Joint Review Panel shall consist of 3 members.

a. The Joint Review Panel shall be composed of no less than two permanent members of the Board.

b. The Minister of the Environment shall jointly with the Chairman of the Board, approve the selection of and appoint the Chair of the Joint Review Panel who shall be a permanent member of the Board.

c. The second permanent member of the Board shall be appointed by the Chairman of the Board.

d. The remaining Joint Review Panel member shall, unless a permanent member of the Board, satisfy the eligibility requirements for temporary

members of the Board and shall be appointed to the Joint Review Panel by the Minister of the Environment. A joint request shall be made by the Minister of the Environment and the Chairman of the Board to the Minister of Natural Resources to recommend to the Governor in Council the appointment of the proposed member as a temporary member of the Board.

e. The members of the Joint Review Panel are to be unbiased and free from any conflict of interest in relation to the Project and are to have knowledge or experience relevant to the anticipated environmental effects of the Project.

4.2 Secretariat to the Joint Review Panel

a. A secretariat will be formed consisting of all relevant and necessary Board personnel and persons designated by the Agency to provide administrative, technical and procedural support to the Joint Review Panel.

b. The Agency will designate Agency staff to assist the Joint Review Panel and work cooperatively with the personnel to be assigned by the Board.

c. Agency staff will be seconded to the Board, as members of the secretariat, for the time assigned to the Review. The Agency will invoice the Board for time and disbursements.

d. The Agency will ensure that all other activities performed for the Agency by the Agency staff while seconded to the Board are conducted in a way so as to avoid a conflict of interest with this Review.

4.3 Joint Review Panel Procedures

4.3.1 The Review will follow the National Energy Board Rules of Practice and Procedure, 1995, as amended and made pursuant to section 8 of the NEBA.

4.3.2 The Joint Review Panel shall:

a. Ensure that public consultation sessions are held to assist in the formulation of issues that should be considered in the Review, to receive comments on the information to be requested of the Proponent, and to assist the public in understanding the ways in which it can participate in the hearing process. The location and timing of the sessions will be determined by the Joint Review Panel.

b. Take into consideration comments or submissions received during the public consultation sessions, referred to in article 4.3.2(a) above, and may, at its discretion, broaden the assessment to reflect these comments and submissions.

c. Conduct its Review in a manner which will promote and facilitate public participation.

d. Ensure that the public has a minimum of 60 days to review the environmental assessment documentation submitted by the Proponent in

its application and to submit written comments to the Joint Review Panel on it.

e. Provide the public with the opportunity to review and comment on any additional information submitted to the Joint Review Panel by the Proponent prior to the commencement of final argument, through Letters of Comment.

f. Provide the public with the opportunity to appear before the Joint Review Panel at a public hearing.

g. Ensure a minimum of 45 days notice of the public hearings from the deadline for requesting Intervenor status to the commencement of the public hearings.

h. Ensure that all information produced or received by the Joint Review Panel is made available to the public pursuant to section 2.3 of this Agreement unless specific procedural rulings or legislative provisions prevent the disclosure of the information.

i. Ensure that public hearings shall not proceed until the Joint Review Panel has determined that the documentation appearing on the public record, in the Panel's view, constitutes adequate information to proceed to public hearings.

4.4 Reporting and Decision Making

4.4.1 The Joint Review Panel Report shall set out the Joint Review Panel's rationale, conclusions and recommendations, including any mitigation measures and follow-up programs and a summary of any comments received from the public.

4.4.2 The Joint Review Panel Report shall be prepared in both official languages and submitted to the Minister of the Environment and the Joint Review Panel Report will be published.

4.4.3 The Minister of the Environment will forward the Report to all Responsible Authorities.

4.4.4 In respect of the Project to be reviewed under the Joint Review Panel process, the Board and other Responsible Authorities shall together agree on a schedule for taking a course of action under subsection 20(1) or 37(1) of the CEAA and for making a recommendation to the Governor in Council under subsection 5(2) of the CEAA.

5. AMENDMENTS AND TERMINATION

5.1 Amendments to this Agreement may be made upon written notice by a Party to the other Party and upon the mutual consent of the Chairman of the Board and the Minister of the Environment.

5.2 Any Party may terminate this Agreement upon one month's written notice to the other Party.

5.3 Subject to section 27 of the CEAA, a Party's eligibility to withdraw from or terminate this Agreement will end at the commencement of the public hearings.

5.4 The attached Appendix forms an integral part of this Agreement.

WHEREAS the Parties hereto have put their signatures this _____ day of _____2001.

The Honourable David Anderson	Kenneth W. Vollman
Minister of the Environment	Chairman, National Energy Board

APPENDIX

Terms of Reference

The definitions in the Agreement Between the National Energy Board and the Minister of the Environment Concerning Review of the GSX Canada Pipeline Project will apply to this Appendix.

1. The Joint Review Panel will conduct a Review of the environmental effects of the Project and the appropriate mitigation measures based on the Project Description provided under Part I.
2. The Joint Review Panel will include in its Review of the Project, consideration of the factors identified in Part II.

Part I - Project Description

Undertakings proposed by the Proponent or likely to be carried out in relation to the physical works proposed by the Proponent, including:

Construction, operation, decommissioning and abandonment of,

approximately 59.9 km of 406 mm O.D. natural gas pipeline (approximately 44.3 km offshore and 15.6 km onshore) from a point on the Canada - United States border in Boundary Pass roughly midway between the east end of Saturna Island (BC) and the west end of Patos Island (WA) to an interconnection with the existing Centra Gas British Columbia Inc. (Centra) pipeline at a point west of Shawnigan Lake on Vancouver Island, south of Duncan;

mainline block valves located just landward of the Vancouver Island shoreline and at an intermediate point between the landfall and the Centra interconnection;
a line block valve/blow off assembly, an excess flow control valve, a check valve, a separator, pig receiving equipment, liquid handling/storage equipment and Multiple Address System (MAS) radio equipment (including a free standing tower approximately 44 m in height) located at the Centra interconnection;
a Supervisory Control and Data Acquisition (SCADA) system linking the above facilities to control centres;
permanent access roads, communications system and power supply as may be required to service mainline valve sites and other pipeline facilities; and
various temporary construction workspace, equipment laydown areas, and access roads.

Part II - Factors to be Considered During Review

The Review will include a consideration of the following factors listed in subsections 16(1)(a) to (d) and 16(2) of the CEAA:

1. The environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
2. The significance of the effects referred to in paragraph 1;
3. Comments from the public that are received during the Review;
4. Measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
5. The purpose of the Project;
6. Alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means;
7. The need for, and the requirements of, any follow-up program in respect of the Project; and
8. The capacity of renewable resources that are likely to be significantly affected by the Project

to meet the needs of the present and those of the future.

In accordance with subsection 16(1)(e) of the CEAA, the assessment by the Joint Review Panel will also include a consideration of the following additional matters:

9. Need for the Project;
10. Alternatives to the Project;
11. Description of the present environment which may reasonably be expected to be affected, directly or indirectly, by the Project, including adequate baseline characterization;
12. Measures to enhance any beneficial environmental effects; and
13. Proposal for Contingency and Emergency Response Plans.

Part III - Scope of Factors

The Review will consider the potential effects of the Project within spatial and temporal boundaries which encompass the periods and areas during and within which the Project may potentially interact with, and have an effect on, components of the environment. These boundaries will vary with the issues and factors considered, and will reflect:

the construction, operation, decommissioning, abandonment or other undertakings that are proposed by the Proponent or that are likely to be carried out in relation to the physical works proposed by the Proponent;
the natural variation of a population or ecological component;
the timing of sensitive life cycle phases in relation to the scheduling of the Project;
the time required for an effect to become evident;
the time required for a population or ecological component to recover from an effect and return to a pre-effect condition, including the estimated degree of recovery;
the area affected by the Project; and
the area within which a population or ecological component functions and within which a Project effect may be felt.

Appendix B

The Panel Members

Ms. Elizabeth Quarshie (Chair)

Elizabeth Quarshie was appointed Member of the National Energy Board on September 27, 1999 for a seven-year term. Ms. Quarshie held various senior management positions at Cogema Resources, Inc. in Saskatoon, Saskatchewan. Her last position was Director of Compliance, Audit and Evaluation. Ms. Quarshie was born in Accra, Ghana and has been a Canadian citizen for over 20 years. She holds a graduate degree in Environmental Engineering from Washington State University and is a Member of the Association of Professional Engineers and Geoscientists of Saskatchewan. In addition, she is a Certified Professional Environmental Auditor.

Mr. Rowland Harrison

Rowland Harrison was appointed Member of the National Energy Board on October 1, 1997 for a seven-year term. Mr. Harrison has extensive experience as an advisor on energy regulation to provincial, territorial, federal and foreign governments. He has been Professor of Law at the University of Ottawa, Dalhousie University, the University of Calgary and the University of Alberta. Before joining the Board, he was a partner in the Calgary office of Stikeman Elliott, a national and international Canadian law firm. Mr. Harrison holds a Bachelor of Law Degree from the University of Tasmania, Australia, and a Master of Law degree from the University of Alberta. He is a member of the bars of Nova Scotia, Ontario and Alberta.

The Honourable Bryan Williams, Q.C.

Bryan Williams is a retired Chief Justice of the Supreme Court of British Columbia. Since his retirement in May 2000, he has worked as associate counsel with the law firm Miller Thomson LLP, formerly Swinton & Company, where he practiced from 1958 until his appointment to the British Columbia Court of Appeal in 1995. As senior counsel at Swinton & Company, Mr. Williams was involved in major litigation in the province of British Columbia, including a landmark case on Aboriginal rights, *Delgamuuk v. Her Majesty the Queen*, in which he represented

the province of B.C. His legal practice focused mainly on arbitration and mediation, commercial law, constitutional law, Aboriginal law and environmental law.

Mr. Williams has held directorships with several community organizations, including the World Wildlife Fund of Canada. He was also a member of the British Columbia Round Table on the Economy and Environment. Mr. Williams also chaired the Sustainable Development Strategy Committee, was a founding Director of the Laurier Institution on Multiculturalism, and was appointed by the government of British Columbia as a special commissioner for planning process at Cypress Provincial Park in 1994. He also chaired the Port Hardy Ferrochromium Review Panel in 1990, and the Special Committee on British Columbia Wilderness and Land Allocation, establishing new parks and existing park boundaries, in 1986.

Mr. Williams holds a Bachelor of Commerce degree and a Bachelor of Laws from the University of British Columbia. He also received an Honorary Doctor of Laws degree from the University of Victoria, and was the recipient of the 125th Confederation of Canada Medal of Honour.

Appendix C

Hearing Order / Directions on Procedure

National Energy Board

Office national de l'énergie

File 3200-G49-1
9 November 2001

Mr. D.G. Davies
Macleod Dixon LLP
Barristers & Solicitors
3700 Canterra Tower
400 - 3rd Avenue S.W.
Calgary, Alberta
T2P 4H2
Facsimile (403) 264-5973

Dear Mr. Davies:

Hearing Order GH-4-2001 - Georgia Strait Crossing Pipeline Limited (GSX PL)
GSX Canada Pipeline Project - Directions on Procedure

The Joint Review Panel for the GSX Canada Pipeline (the Panel) has scheduled an oral public hearing starting on 17 June 2002 in British Columbia, to consider the matter of the proposed GSX Canada Pipeline Project (GSX Canada Pipeline or the Project). Information on the various locations and times of the hearing will be announced later. The attached Hearing Order GH-4-2001 provides the Directions on Procedure (DOP), which describes the hearing process.

The Panel will act as a joint review panel under the *Canadian Environmental Assessment Act* (CEA Act) to make recommendations to the Minister of the Environment pursuant to that Act, and as a National Energy Board (the Board) panel under the *National Energy Board Act* (NEB Act) to determine matters relevant to the application respecting the Project and falling within the Board's jurisdiction under the NEB Act, and the CEA Act. A copy of the Agreement establishing the Panel can be found on the Board's website (www.neb-one.gc.ca) and the Canadian Environmental Assessment Agency's (CEA Agency) website (www.ceaa-acee.gc.ca).

In deciding to issue this Directions on Procedure, the Panel has noted the submissions of GSX Concerned Citizens Coalition (GSX Coalition) on the sufficiency of information on natural gas supply filed by GSX PL. The Panel will decide how it will proceed to consider these submissions once the deadline for interventions has passed and a List of Parties has been established. The Panel wishes to assure interested persons that the oral hearing will not proceed until the Panel has determined that the documents appearing on the public record, in the Panel's view, constitute adequate information to proceed to oral hearing.

444 Seventh Avenue SW
Calgary, Alberta T2P 0X8

444, Septième Avenue S.-O.
Calgary (Alberta) T2P 0X8

Canada

Telephone/Téléphone (403) 292-4800
Facsimile/Télécopieur (403) 292-5503
http://www.neb-one.gc.ca

In establishing the Timetable of Events, Appendix 3 to the GH-4-2001 Hearing Order, the submissions of GSX Coalition, the Society Promoting Environmental Conservation and the David Suzuki Foundation, the Sencot'en Alliance, and GSX PL, as well as comments made at the public information sessions held during the week of 22 October 2001 were considered.

On 18 June 2001, the CEA Agency announced participant funding to assist public involvement in the review of environmental effects of the Project. Participant funding will be administered and managed by the CEA Agency. Allocation of available funds will be made by the CEA Agency on the basis of applications received by it no later than 30 November 2001. For further information on the Participant Funding Program, please contact Ms. Martynn St-André at the CEA Agency, 200 Sacré-Coeur Boulevard, Hull, Québec, K1A 0H3. Ms. St-André can also be reached at (819) 994-4049 (telephone), (819) 997-4931 (facsimile), or martynn.st-andre@ceaa.gc.ca (e-mail).

The Panel directs GSX PL to make available for public viewing at the Vancouver Island Regional Library, Port Alberni Branch all documents relating to this application and the public hearing process. This location is in addition to the locations where GSX PL has already identified that it will keep copies of all documents available for public viewing.

The Panel directs GSX PL to serve immediately, in both official languages, a copy of the DOP (including appendices) and this letter on all persons listed in the Preliminary List of Parties. Furthermore, GSX PL is required to file with the Secretary to the Panel a list of all parties served.

Yours truly,

Michel L. Mantha
Secretary to Joint Review Panel
GSX Canada Pipeline Project

Attachments

c.c: Ms. Sandra M. Jones, GSX PL
Mr. Mark C. Moench, GSX PL, c/o Williams Gas Pipelines - West
Persons who expressed interest in receiving the DOP
Persons who have filed comments

National Energy Board

Office national de l'énergie

File 3200-G49-1
9 November 2001

Hearing Order GH-4-2001
Directions on Procedure

Georgia Strait Crossing Pipeline Limited
GSX Canada Pipeline

On 24 April 2001, Georgia Strait Crossing Pipeline Limited (GSX PL) applied to the National Energy Board (the Board or NEB) pursuant to Part III of the *National Energy Board Act* (the NEB Act) for a Certificate of Public Convenience and Necessity to construct and operate a new natural gas pipeline and related facilities. GSX PL has also applied for related toll and tariff authorizations pursuant to Part IV of the NEB Act.

The proposed GSX Canada Pipeline Project (GSX Canada Pipeline or the Project) would have an outside diameter of 406 mm (16 inch) and an initial design capacity of 2.71 $10^6 m^3$ (96 MMcf) of natural gas per day. It would extend 60 km from the Canada-United States border in Boundary Pass east of Saturna Island, British Columbia to an interconnection with the existing Centra Gas British Columbia Inc. pipeline west of Shawnigan Lake on Vancouver Island, British Columbia. The GSX Canada Pipeline is the Canadian portion of the Georgia Strait Crossing Project that would transport natural gas from existing pipeline systems near Sumas, Washington to Vancouver Island.

The proposed GSX Canada Pipeline is subject to assessment and review under the NEB Act and the *Canadian Environmental Assessment Act* (the CEA Act). To avoid two hearings, one oral public hearing will be conducted by a Joint Review Panel (the Panel). Under the CEA Act, the Panel will make recommendations to the Minister of the Environment and under the NEB Act it will determine all matters relevant to the application.

Participant funding for individuals and organizations wishing to take part in the public review of the Project was announced by the Canadian Environmental Assessment Agency (CEA Agency) on 18 June 2001. The purpose of this funding program is to assist the public in participating in the review of the environmental effects of the Project. Allocation of available funds will be made by the CEA Agency on the basis of applications received by it no later than 30 November 2001. For further information on the Participant Funding Program, please contact:

Ms. Martynn St-André
Canadian Environmental Assessment Agency
200 Sacré-Coeur Boulevard
Hull, Québec, K1A 0H3
Phone: (819) 994-4049
Facsimile: (819) 997-4931
martynn.st-andre@ceaa.gc.ca

Canada

.../2

This DOP is made up of the following parts:

1. Public Viewing
2. List of Issues
3. Public Participation
4. Application for Intervenor Status
5. Timetable of Events
6. Hearing Information
7. Document Distribution
8. Notice of Public Hearing
9. Distribution of DOP
10. General
11. Information/Inquiries

1. Public Viewing

GSX PL shall make available for public viewing, at the following locations, all documents relating to this application and public hearing process. The documents kept at these locations shall include the application, transcripts of the oral hearing (see section 10) as well as other documents introduced prior to, and at, the hearing:

Georgia Strait Crossing Pipeline Limited
17th Floor, 333 Dunsmuir Street
Vancouver, British Columbia
V6B 5R3

Vancouver Island Regional Library
Duncan Branch
2687 James Street
Duncan, British Columbia
V9L 2X5

Vancouver Island Regional Library
Sidney/North Saanich Branch
10091 Resthaven Drive
Sidney, British Columbia
V8L 3G3

Vancouver Public Library
Central Branch
350 West Georgia Street
Vancouver, British Columbia
V6B 6B1

Pender Island Public Library
4407 Bedwell Harbour Road
North Pender Island, British Columbia
V0N 2M1

Greater Victoria Public Library
735 Broughton Street
Victoria, British Columbia
V8W 3H2

Vancouver Island Regional Library
South Cowichan Branch
2720 Mill Bay Road
Mill Bay, British Columbia
V0R 2P0

Vancouver Island Regional Library
Port Alberni Branch
4245 Wallace Street
Port Alberni, British Columbia
V9Y 3Y6

Mayne Island Library
Mayne Island, British Columbia
V0N 2J0

Salt Spring Island Public Library
129 McPhillips Avenue
Salt Spring Island, British Columbia
V8K 2T6

Saturna Island Library
St. Christopher's Church (basement)
Saturna Island, British Columbia

National Energy Board
Library, Main Floor
444 - Seventh Avenue S.W.
Calgary, Alberta
T2P 0X8

Electronic copies of the documents issued by the Panel and intervenors and letters of comment will be available at the Board's website (www.neb-one.gc.ca). The application and supporting documents filed by GSX PL can be viewed at the GSX PL website (www.gsxreg.com).

2. List of Issues

Based on its examination of GSX PL's application thus far, the Panel has established a List of Issues (see Appendix 1). **If you wish to suggest an amendment or an addition to the List of Issues, you may do so in writing when you register as an intervenor (see section 4), or orally at the public consultation sessions (see section 3) to be held in British Columbia in January 2002.** When proposing an additional issue, clearly explain its relevance to the hearing. After the public consultation sessions, the Panel will revise the List of Issues. This list is to provide guidance to GSX PL and intervenors on which issues will be considered at the hearing. However, the Panel is not limited to a consideration of only these issues.

3. Public Participation

The GH-4-2001 public hearing process will proceed in three phases: public consultation for scope; information gathering through a written process; and an oral hearing. You can participate in the public hearing process in the following ways:

(a) Public Consultation Sessions

The Panel will host public consultation sessions for people to provide comments on what issues they believe should be considered in the hearing. The Panel also wishes to receive comments on any additional information you think should be requested of GSX PL. These sessions will be held as follows:

Friday 11 January 2002	Vancouver, B.C.
Saturday 12 January 2002	Sidney, B.C.
Saturday 12 January 2002	Sidney, B.C. (regarding First Nations interests)
Monday 14 January 2002	Cobble Hill, B.C.
Tuesday 15 January 2002	Duncan, B.C. (regarding First Nations interests)
Wednesday 16 January 2002	Salt Spring Island, B.C.
Thursday 17 January 2002	Victoria, B.C.
Friday 18 January 2002	Saturna Island, B.C.

Further information on these sessions will be announced later.

At each public consultation session staff will be available to explain the procedures for the hearing scheduled for June 2002 and to answer related questions.

(b) The Hearing

You may participate in the hearing by either (i) providing comments on the proposed project or (ii) by seeking intervenor status. You can provide comments or you can be an intervenor. **You cannot do both.** However, if you become an intervenor, anytime in the process you can choose to withdraw your intervention and then simply provide your comments. These two processes for participation are described below.

(i) Comments

You may provide written comments to the Panel.

If you only wish to make written comments to the Panel regarding the GSX Canada Pipeline, you may do so by submitting a "letter of comment". **Letters of comment may be sent at any time prior to the start of final argument at the public hearing.** A letter of comment is simply a written letter that provides the Panel with your views on the proposed Project. It should describe the nature of your interest in the application and provide any relevant information that explains or supports your comments. Letters must include your full mailing address, phone number, your name, and if you represent an organization, the name of the organization. Letters must be sent to:

Michel L. Mantha
Secretary, Joint Review Panel, GSX Canada Pipeline Project
444 Seventh Avenue S.W.
Calgary, Alberta T2P 0X8
Facsimile: (403) 292-5503
e-mail: secretary@neb-one.gc.ca

If you choose to participate by providing comments you will not receive further documents and you cannot participate in other aspects of the hearing. **Your involvement is limited to providing comments.**

(ii) Interventions

If you are interested in actively participating in all aspects of the hearing you may apply to the Panel for "intervenor status", either in the form set out in Appendix 2, or in a letter (see Section 4). Intervenors are entitled to: submit evidence and may be subject to questions by other parties on their evidence; question the applicant and other intervenors on their evidence; and submit final argument at the end of the hearing.

When applying to become an intervenor, you must provide some details on your participation:

- You can choose whether or not to receive copies of the documents prior to the hearing. If you choose not to receive all the documents you can view them at the locations referred to in Section 1.
- You can choose to present your evidence orally and not file it in writing prior to the start of the hearing if it is based on your views, opinions or concerns and if you are not relying on any documents, studies or written information.
- You can ask the Panel to ensure that any documents you submit to the Panel before the start of the hearing are provided to all other parties. Your request to the Panel must explain why it is not reasonable for you to do so yourself.
- You may decide that you do not wish to ask any questions of other parties on their evidence or provide argument at the end of the hearing. In this case your views can be heard at the start of the hearing. The Panel will arrange for one of its lawyers to be available in the hearing room and provide assistance on the hearing process.

The deadline to apply for intervenor status is 6 December 2001. However, the Panel, at its discretion, may accept late interventions.

4. Application for Intervenor Status

An application for intervenor status must be sent to the Secretary of the Panel (the Secretary) and a copy sent to GSX PL by 6 December 2001. You may complete and submit the form attached as Appendix 2 or submit a letter that contains the same information.

Even if you have previously received Panel correspondence on this project, or are included in the preliminary List of Parties (Appendix 6), you will not automatically be included as an intervenor in this hearing. **To participate in these proceedings you must either submit an application for intervenor status by 6 December 2001, or file a letter of comment before final argument, which occurs near the end of the oral hearing.**

If you are concerned that your intervention may not be received by the Panel or GSX PL by the 6 December 2001 deadline, please call Mr. Guy C. Hamel, Regulatory Officer, toll free at 1-800-899-1265, or e-mail: secretary@neb-one.gc.ca.

5. Timetable of Events

A timetable for filing and serving documents is provided in Appendix 3. A description of key events is provided below.

(a) Additional Written Evidence from the Applicant

Any additional evidence that GSX PL wishes to present shall be given to the Secretary and copied to all parties no later than 7 March 2002.

When applying to become an intervenor, you must provide some details on your participation:

- You can choose whether or not to receive copies of the documents prior to the hearing. If you choose not to receive all the documents you can view them at the locations referred to in Section 1.
- You can choose to present your evidence orally and not file it in writing prior to the start of the hearing if it is based on your views, opinions or concerns and if you are not relying on any documents, studies or written information.
- You can ask the Panel to ensure that any documents you submit to the Panel before the start of the hearing are provided to all other parties. Your request to the Panel must explain why it is not reasonable for you to do so yourself.
- You may decide that you do not wish to ask any questions of other parties on their evidence or provide argument at the end of the hearing. In this case your views can be heard at the start of the hearing. The Panel will arrange for one of its lawyers to be available in the hearing room and provide assistance on the hearing process.

The deadline to apply for intervenor status is 6 December 2001. However, the Panel, at its discretion, may accept late interventions.

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Even if you have previously received Panel correspondence on this project, or are included in the preliminary List of Parties (Appendix 6), you will not automatically be included as an intervenor in this hearing. **To participate in these proceedings you must either submit an application for intervenor status by 6 December 2001, or file a letter of comment before final argument, which occurs near the end of the oral hearing.**

If you are concerned that your intervention may not be received by the Panel or GSX PL by the 6 December 2001 deadline, please call Mr. Guy C. Hamel, Regulatory Officer, toll free at 1-800-899-1265, or e-mail: secretary@neb-one.gc.ca.

5. Timetable of Events

A timetable for filing and serving documents is provided in Appendix 3. A description of key events is provided below.

(a) Additional Written Evidence from the Applicant

Any additional evidence that GSX PL wishes to present shall be given to the Secretary and copied to all parties no later than 7 March 2002.

Intervenors who do not wish to cross-examine or provide final argument will be heard first.
GSX PL will present its evidence and make its witnesses available for cross-examination.
Intervenors in attendance will have an opportunity to cross-examine GSX PL's witnesses.
GSX PL will present evidence in order to clarify matters raised in cross-examination (redirect evidence).
Intervenors in attendance will present or adopt their evidence and make themselves available to answer questions from GSX PL and others.
Intervenors will present redirect evidence if necessary to clarify matters that were raised in cross-examination.

At the conclusion of the evidentiary phase, the Panel will note the deadline for filing letters of comment.

The final argument phase will then commence.

GSX PL will present its final argument
Intervenors will present their final argument
GSX PL will have an opportunity to respond to intervenors' final argument

The oral hearing will end.

7. Document Distribution

After receiving all the applications for intervenor status, the Panel will release a List of Parties on or about 13 December 2001.

(a) Parties

Unless otherwise directed by the Panel, GSX PL shall provide a copy of the original application (and any subsequent submissions) to all of the persons named in the List of Parties (and in any revisions thereto), with the exception of those who have indicated that they do not require personal copies of the documents.

Upon receipt of the List of Parties, each intervenor shall provide a copy of its intervention to all other intervenors unless the Panel has agreed to do so for the intervenor.

(b) Distribution

(i) Where a party is required to provide documents to other parties prior to the start of the oral hearing, the following number of copies shall be provided:

for documents to be provided to the Panel or the Secretary to the Panel, 25 copies;
for documents to be provided to GSX PL, three copies; and
for documents to be provided to intervenors, one copy each.

(ii) People providing documents at the oral hearing shall give 15 copies to the Hearing Officer and shall leave sufficient copies for parties at a designated location in the hearing room. Intervenors wishing to file documents at the oral hearing may request that the Panel supply these extra copies on their behalf.

(iii) People submitting letters of comment shall give one copy to GSX PL and one copy to the Secretary. Through the Secretary, the Panel will provide copies for all other parties. Any reply made by GSX PL or an intervenor to a letter of comment shall be given to the Secretary and copied by the author to all parties on the List of Parties, as well as to the person who submitted the letter of comment. Upon request, the Panel may also provide this service to intervenors.

(iv) People providing documents less than five days prior to the start of the oral hearing shall bring to the hearing a sufficient number of copies of the documents for use by the Panel and other parties present at the oral hearing.

(v) Where a party is required to provide a document on a specified date, it must be received by the intended recipient no later than **noon** on that date at the place of service (i.e., at the business or personal address shown on the List of Parties).

8. Notice of Public Hearing

The Panel directs GSX PL to publish forthwith the attached Notice of Public Hearing (Appendix 4) in each of the publications listed in Appendix 5, in the following manner:

(a) for each publication listed in Appendix 5, the notice shall include a map showing the location of the proposed facilities at a scale which indicates with reasonable accuracy the locations of the proposed facilities in relation to prominent topographical features or landmarks such as rivers, population centers, highways and utilities; and

(b) each notice shall identify a location (e.g., local municipal office), within or near the area covered by the plan, where pipeline route sheets for that area are available for inspection by the public.

9. Distribution of DOP

The Panel directs GSX PL to provide immediately a copy of this DOP (including appendices) to all persons listed in the Preliminary List of Parties (Appendix 6) in both official languages. GSX PL is directed to file with the Secretary to the Panel a list of persons that were given a copy.

10. General

(a) You have the right to use the official language of your choice when you participate in this process. When applying for intervenor status, you should indicate the official language in which you wish to communicate with the Panel and be heard at the oral hearing. If it appears that both official languages will be used at the hearing, simultaneous interpretation will be provided. Please note that documents filed by parties (including letters of comment) will not be translated.

(b) People shall quote **File 3200-G49-1** and **Hearing Order GH-4-2001** when corresponding on matters related to the GSX Canada Pipeline Project.

(c) These Directions on Procedure supplement the *National Energy Board Rules of Practice and Procedure, 1995, as revised,* which can be found on the Board's website www.neb-one.gc.ca.

(d) The oral hearing will be recorded and transcribed daily. Transcripts will be available on the Board's website (www.neb-one.gc.ca) and the CEA Agency website (www.ceaa-acee.gc.ca). Upon request, one hard copy of the daily transcript will be provided to GSX PL and to each participating intervenor at no cost, except for delivery, if applicable. Costs of any subsequent copies, including delivery, are the responsibility of the requesting party.

(e) Participation in the hearing process, including the ability to conduct cross-examination and present argument, may be accommodated by way of telephone conference.

(f) The Panel wishes to remind you that it encourages fairness and efficiency in all of its proceedings and therefore asks that all parties and persons observe the deadlines set out in these Directions on Procedure. Departure from a deadline will not be permitted unless, in the Panel's view, it can be reasonably justified.

11. Information/Inquiries

For information relating to this hearing or for general enquiries regarding the hearing process (including requests for NEB public materials), please contact:

- National Energy Board (toll-free at 1-800-899-1265) and specify the GSX Canada Pipeline hearing;
- Mr. Guy C. Hamel (phone: 403-299-3927 or e-mail: secretary@neb-one.gc.ca); or
- the Board's website at www.neb-one.gc.ca (to access Hearing Order GH-4-2001, click on "Regulatory Update" and then "Hearing Orders for Upcoming Hearings").

JOINT REVIEW PANEL

Michel L. Mantha
Secretary

List of Issues

The Joint Review Panel has identified, but does not limit itself to, the following issues for consideration in the hearing:

1. The economic feasibility of the proposed GSX Canada Pipeline having regard to, among other things:
   the outlook for long-term demand for natural gas in the markets proposed to be served by the proposed pipeline;
   the outlook for the long-term supply of natural gas available to be transported on the proposed pipeline; and
   the ability of the proposed GSX Canada Pipeline Project to attract volumes to its system over the long term.

2. The potential environmental and socio-economic effects of the proposed GSX Canada Pipeline Project including those factors set out in subsections 16(1) and 16(2) of the *Canadian Environmental Assessment Act* as described below:
   the environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
   the significance of the effects referred to in the paragraph above;
   comments from the public that are received during the review;
   measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
   the purpose of the Project;
   alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means;
   the need for, and the requirements of, any follow-up program in respect of the Project;
   the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future;
   need for the Project;
   alternatives to the Project;
   a description of the present environment which may reasonably be expected to be affected, directly or indirectly, by the Project, including adequate baseline characterization;
   measures to enhance any beneficial environmental effects; and
   proposal for contingency and emergency response plans.

3. The potential impact on landowners and communities affected by the selected route of the proposed pipeline.

4. The appropriateness of the routing and location of the proposed facilities, land requirements and land rights acquisition process.

5. The safety and the design of the proposed facilities.

6. The reasonableness of the proposed tolling methodology.

7. The terms and conditions to be included in any certificate which may be granted.

APPLICATION FORM FOR
INTERVENOR STATUS

GSX Canada Pipeline Project
GH-4-2001 Proceeding

A. Name: _____

Telephone: _____ Facsimile: _____

Addresses:

Mail: _____

Residence Address (if different from mailing address):

_____

E-mail: _____

If applicable, please provide the following for any authorized representative:

Name: _____

Telephone: _____ Facsimile: _____

Addresses:

Mail: _____

Residence Address (if different from mailing address):

_____

E-mail: _____

B. Do you intend to appear at the public hearing?

Yes ____ No ____

C. If you do not intend to participate actively at the hearing, please provide the reasons for wanting intervenor status for this hearing.

_____

_____

_____

_____

D. What is the official language in which you wish to be heard?

English ____ French ____

E. What is your specific interest in regard to the project?

_____

_____

_____

_____

F. Do you wish to receive your own copy of all written documents? You may view documents at various locations (see section 1 of the DOP for locations).

I wish to receive all written documents

Yes ____ No ____

G. Your evidence, and any related documents, must be filed in writing before the start of the oral hearing if you intend to rely on or refer to written documents or if your evidence is detailed or technical.

Will you be filing written evidence?

Yes ____ No ____

H. Do you need Panel staff to distribute your documents to other parties?

Yes ____ No ____

If yes, why?

_____

_____

_____

I. Do you intend to question GSX PL or intervenors on their evidence?

Yes ____ No ____

J. Do you intend to present final argument at the end of the hearing?

Yes ____ No ____

Note: If you do not intend to question others or present final argument your evidence can be heard at the beginning of the hearing.

K. What specific issues do you intend to address at the hearing or wish to add to the List of Issues? Please provide a justification for the latter.

L. Do you require a copy of the daily transcripts?

Yes ____ No ____

Signature: _____

Date: _____

Please submit this form by mail or facsimile to:

Mr. Michel L. Mantha
Secretary
Joint Review Panel, GSX Canada Pipeline Project
444 Seventh Avenue S.W.
Calgary, Alberta T2P 0X8
Fax: (403) 292-5503

Note: If you are concerned that your intervention may not be received by the Panel or GSX PL by the 6 December 2001 deadline, please call Mr. Guy C. Hamel, Regulatory Officer, toll free at 1-800-899-1265, or e-mail: secretary@neb-one.gc.ca.

Joint Review Panel

GSX Canada Pipeline Project

Timetable of Events

Event	Deadline for Service and Filing
Filing of Interventions [4][2]	6 December 2001[3]
Deadline for Proposing Amendments/Additions to the List of Issues	6 December 2001
Public Consultation Sessions Commence [3]	11 January 2002
Revised List of Issues, as appropriate, resulting from Public Consultation Sessions [2]	---
Additional Written Evidence from the Applicant [5]	7 March 2002
Information Requests to the Applicant [5]	28 March 2002
Applicant's Responses to Information Requests [5]	18 April 2002
Intervenor Written Evidence [5]	9 May 2002
Letters of Comment[4] [3,5,6]	----
Information Requests to the Intervenors [5]	16 May 2002
Intervenors' Responses to Information Requests [5]	6 June 2002
Oral Hearing Commences [6]	17 June 2002

2 The numbers in square brackets refer to the corresponding sections in the Directions on Procedure.

3 The Panel may accept late interventions. Any requests for late intervention must be by persons having an interest in the GH-4-2001 proceeding and must contain an explanation of why they were not able to meet the 6 December 2001 deadline.

4 Interested persons may file letters of comment with the Joint Review Panel any time prior to the commencement of final argument near the end of the hearing.

NATIONAL ENERGY BOARD
- AND -
CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY
NOTICE OF PUBLIC HEARING
OF
JOINT REVIEW PANEL
GSX Canada Pipeline Project

The Joint Review Panel for the GSX Canada Pipeline Project (the Panel) has scheduled a public hearing to consider an application made by Georgia Strait Crossing Pipeline Limited (GSX PL) to construct and operate the GSX Canada Pipeline (the Project). The oral hearing will commence on 17 June 2002 in British Columbia at locations to be announced later.

The proposed Project is a 60 kilometre, 406 millimetre (16 inch) outside diameter natural gas pipeline and related facilities. The initial design capacity is 2.71 million cubic metres (96 million cubic feet) of gas per day. The proposed pipeline would extend from the Canada-United States border in Boundary Pass east of Saturna Island, British Columbia to an interconnection with the existing Centra Gas British Columbia Inc. pipeline west of Shawnigan Lake on Vancouver Island.

The Panel invites you to submit comments on the proposed Project by writing to the Panel. The final date for accepting written comments will be announced during the public hearing. If you would like to intervene in the proceeding, you must request intervenor status from the Panel by 6 December 2001. For further information on how to submit written comments or register to be an intervenor please check the Directions on Procedure (DOP) for Hearing Order GH-4-2001. The DOP can be obtained:

> at the National Energy Board's website at www.neb-one.gc.ca (click on "Regulatory Update" and then on "Hearing Orders for Upcoming Hearings") or
> by phoning Mr. Guy C. Hamel (toll free at 1-800-899-1265 or 403-299-3927).

Written comments or your request to intervene must be sent to the Panel at the following address:

Mr. Michel L. Mantha
Secretary
Joint Review Panel, GSX Canada Pipeline Project
444 Seventh Avenue S.W.
Calgary, Alberta T2P 0X8
Fax (403) 292-5503

A copy must also be sent to GSX PL at:

Georgia Strait Crossing Pipeline Limited
17th Floor, 333 Dunsmuir Street
Vancouver, British Columbia
V6B 5R3
Attention: Ms. Sandra M. Jones
Fax: (604) 623-4407

The Panel will hold public consultation sessions to review the issues that should be considered at the oral hearing, and to discuss any additional information that may be requested of GSX PL. Panel staff will be on hand to explain hearing procedures and to answer related procedural questions. These sessions will be held at the following locations:

Friday 11 January 2002	Vancouver, B.C.
Saturday 12 January 2002	Sidney, B.C.
Saturday 12 January 2002	Sidney, B.C. (regarding First Nations interests)
Monday 14 January 2002	Cobble Hill, B.C.
Tuesday 15 January 2002	Duncan, B.C. (regarding First Nations interests)
Wednesday 16 January 2002	Salt Spring Island, B.C.
Thursday 17 January 2002	Victoria, B.C.
Friday 18 January 2002	Saturna Island, B.C.

Further information concerning these public consultation sessions will be announced at a later date.

List of Newspapers for Publication of Notice

NOTICE TO BE PUBLISHED IN ENGLISH

Publication	Location
Globe and Mail (National Edition)	Toronto, Ontario
National Post (National Edition)	Toronto, Ontario
Calgary Herald	Calgary, Alberta
Vancouver Sun	Vancouver, B.C.
Victoria Times-Colonist	Victoria, B.C.
Cowichan News-Leader	Duncan, B.C.
Cowichan Pictorial	Duncan, B.C.
Cowichan Valley Citizen	Duncan, B.C.
Gabriola Sounder	Gabriola, B.C
Gulf Islands Driftwood	Saltspring Island, B.C.
Harbour City Star	Nanaimo, B.C.
Island Tides	Pender Island, B.C.
Ladysmith-Chemainus Chronicle	Ladysmith, B.C.
Lake Cowichan Gazette	Lake Cowichan, B.C.
Nanaimo Daily News	Nanaimo, B.C.
Nanaimo News Bulletin	Nanaimo, B.C.
Saanich News	Victoria, B.C.
Sooke News Mirror	Sooke, B.C.
Native Drum	Vancouver, B.C.
Port Alberni Times	Port Alberni, B.C.

NOTICE TO BE PUBLISHED IN FRENCH

Publication	Location
L'Express du Pacifique	Vancouver, B.C.

NOTICE TO BE PUBLISHED IN ENGLISH AND FRENCH

Publication	Location
Canada Gazette	Ottawa, Ontario

Appendix D

Panel Rulings

National Energy Board

Office national de l'énergie

File 3200-G49-1

Date 31 January 2002

To: All Parties to Hearing Order GH-4-2001

Hearing Order GH-4-2001
Georgia Strait Crossing Pipeline Limited (the Applicant)
GSX Canada Pipeline Project (the proposed Project)

In accordance with the procedure set forth in Hearing Order GH-4-2001, the Joint Review Panel (the Panel) recently hosted public consultation sessions to hear the views of the public on what issues the public believes should be considered during the hearing process and to identify any additional information they think should be requested of the Applicant. Eleven sessions were held at various locations in the vicinity of the proposed Project during the period of 11 January to 19 January 2002. The sessions included two meetings regarding First Nations issues and one workshop. A list of presenters, submitters and intervenors providing comments on the initial List of Issues is attached as Appendix I. In reaching its determination regarding what issues should be considered, the Panel has also taken into account the suggestions for additions and changes to the List of Issues contained in applications for intervenor status received by the Panel. Written submissions provided as part of the public consultation sessions were also considered by the Panel.

The Panel would like to thank all participants and presenters to the sessions, including the workshop. The Panel has carefully considered the submissions made by presenters, intervenors, and those participants who submitted written comments on the List of Issues.

In order to catalogue, address and respond to the numerous comments and submissions provided, the Panel has adopted the format outlined below:

1.0 Issues Already Contemplated in the Initial List of Issues

The Panel finds that many presenters raised issues which are considered to be already contemplated within the initial List of Issues, as outlined in Appendix 1 to Hearing Order GH-4-2001, dated 9 November 2001. For example, some presenters asked the Panel to more fully explore the safety, environmental and socio-economic effects arising from the proposed Project. The Panel notes that it will be requesting additional information from the Applicant during the hearing process. Further, the Panel anticipates that intervenors will similarly request information from the Applicant.

2.0 Clarification of the Initial List of Issues

The Panel notes that other issues that have been raised were not clearly set out in the initial List of Issues and finds that further clarification is necessary.

3.0 New Issues

The Panel has found that some presenters identified certain new issues that were not in the initial List of Issues and, therefore, the Panel has added them to the List of Issues, attached as Appendix II.

444 Seventh Avenue SW
Calgary, Alberta T2P 0X8

444, Septième Avenue S.-O.
Calgary (Alberta) T2P 0X8

Canada

Telephone/Téléphone : (403) 292-4800
Facsimile/Télécopieur : (403) 292-5503
http://www.neb-one.gc.ca

4. Issues Not Added to the List of Issues
The Panel has determined that some issues raised by presenters will not be included in the List of Issues for the GH-4-2001 hearing.

5. Issues Requiring Additional Comment
The Panel notes that it cannot, at this time, make a decision on the inclusion or exclusion of some issues that were raised by presenters during the public consultation sessions. Therefore, the Panel has established a written comment process for these issues which will be described in a letter to be sent to counsel for the Applicant and copied to Intervenors to the GH-4-2001 hearing.

The Panel has revised the List of Issues to provide clarification to certain existing issues and added new issues which were identified by the public. This is attached as Appendix II, with changes from the initial List of Issues highlighted in bold.

The Panel notes that the List of Issues is used to focus its examination of the Project. The Panel is not limited to only those issues that are specifically delineated and has a duty to fulfill its mandate under both the *Canadian Environmental Assessment Act* (CEA Act) and the *National Energy Board Act* (NEB Act).

1.0 Issues Already Contemplated in the Initial List of Issues

Purpose of, Need for and Alternatives to the Project

The Panel has a mandate under both the CEA and the NEB Acts. Pursuant to the CEA Act, the federal Minister of the Environment established the scope of the assessment in the Terms of Reference attached to the Joint Panel Agreement. Those Terms of Reference require this Panel to consider the purpose of the proposed Project, the need for the Project, and the alternatives to the Project. The characterization of the need for and purpose of the Project will clearly affect what should be considered as an alternative to the Project. Under section 52 of the NEB Act, the Panel must also consider whether or not the Project is in the present and future public convenience and necessity. This too can involve a consideration of the aforementioned issues.

The Panel heard submissions from numerous presenters as to the purpose of, need for and alternatives to the proposed Project. Many presenters argued that the purpose of the proposed Project was more than the transportation of gas to Vancouver Island. Similarly, its need was not simply the provision of gas to Vancouver Island but was tied to the ultimate use of that gas to generate electricity. Alternatives to the proposed Project, they said, should not be limited to other routes for the proposed pipeline but should include, for example, use of other energy sources such as coal bed methane, hydro (e.g., British Columbia's entitlement under the Columbia River Treaty), "green" power, demand side management, and the refurbishment of the existing transmission cables.

The Province of British Columbia (B.C.) submitted that, while the Panel could consider alternative routes for the pipeline or other means of getting gas to Vancouver Island, it would not be appropriate for the Panel's scope to be expanded to include a wide-ranging review of the provincial government's electricity policy. In particular, the Panel should not consider the means by which the electricity needs of Vancouver Island are met. These issues, B.C. stated, fall within the Province's purview.

Need for, purpose of, and alternatives to were included in the initial List of Issues under Issue 2. The Applicant has provided evidence in relation to those requirements, although not the breadth of evidence seen as necessary by many presenters. The Panel has determined that there is no need to amend those issues as presently described in the List of Issues. The issues as now described will allow this Panel to hear all evidence it considers relevant. The Panel anticipates that questions will be asked of the Applicant by intervenors seeking to expand the evidentiary record on these matters and testing the evidence of the Applicant. The Panel recognizes that, during this process, the matters raised by B.C. in relation to these issues may become the subject of argument before the Panel. As no amendment is required to the List of Issues, that argument is not necessary at this time.

However, the Panel believes that it may be useful to draw to the attention of participants the statutory basis for these issues. As noted earlier, these matters must be considered by the Panel pursuant to the CEA Act. However, there is no mandatory requirement under that Act that the alternative proposed by the Applicant be the most environmentally benign alternative. Under the CEA Act, a Panel is required to undertake an environmental assessment of the proposed Project taking into account certain factors, such as the need for the Project, and prepare a report containing its conclusions and recommendations. The assessment report is then taken into consideration by federal government departments and agencies when determining whether or not they will further consider the proposed Project under their respective mandates. A Panel's report must be sufficient to allow those departments and agencies to determine whether or not, with mitigation measures, the Project is likely to cause significant adverse environmental effects. If the Project is likely to cause such effects, the departments and agencies must then determine if the effects can be justified in the circumstances. In making a determination of justification, information on the purpose of, need for and alternatives to the Project contained in a Panel Report would likely be useful. That is one reason that this Panel sees as a basis for the consideration and inclusion of these issues in its environmental assessment of the proposed Project.

Under the NEB Act, the Panel must consider whether the proposed Project is in the present and future public convenience and necessity. This too can involve a consideration of the aforementioned issues. Again, there is no mandatory requirement under the NEB Act that the Applicant proves that the proposed Project is the most environmentally benign alternative. It is up to a Panel considering an application to determine whether or not a proposed project meets the public convenience and necessity test. In making that determination, a Panel normally considers some or all of the factors described in section 52 of the NEB Act and any other factors it considers relevant. Section 52 states:

> The Board may, subject to the approval of the Governor in Council, issue a certificate in respect of a pipeline if the Board is satisfied that the pipeline is and will be required by the present and future public convenience and necessity and, in considering an application for a certificate, the Board shall have regard to all considerations that appear to it to be relevant, and may have regard to the following:
>
> (a) the availability of oil, gas or any other commodity to the pipeline;
> (b) the existence of markets, actual or potential;
> (c) the economic feasibility of the pipeline;

(d) the financial responsibility and financial structure of the applicant, the methods of financing the pipeline and the extent to which Canadians will have an opportunity of participating in the financing, engineering and construction of the pipeline; and

(e) any public interest that in the Board's opinion may be affected by the granting or the refusing of the application.

As noted, the initial List of Issues already includes the purpose of, need for and alternatives to the proposed Project and the evidence on these issues can be developed during the course of the hearing. The Panel notes, however, that if parties see these issues as requiring a detailed examination of the entire provincial energy policy and energy strategy for B.C., they will need to demonstrate to this Panel that it has the necessary jurisdiction to undertake such a review and the relevance of such an examination to the proposed Project being considered by this Panel.

Transboundary Environmental Effects

Several participants raised the question of the consideration of the effects in Canada of the construction and operation of the United States (U.S.) portion of the proposed international pipeline. The Panel notes that it is required to consider the cumulative environmental effects of the Canadian portion of the proposed pipeline. This means that the environmental effects of the U.S. portion of the pipeline that would interact with the environmental effects of the Canadian portion of the pipeline are to be considered. The consideration of cumulative effects is included in the initial List of Issues under Issue 2 and, therefore, these effects will be considered by the Panel.

The Panel recognizes that it is possible that there could be environmental effects in Canada of the construction and operation of the proposed U.S. portion of the pipeline which might not be assessed as cumulative effects in conjunction with the Canadian portion of the proposed pipeline. Should it be found that there are environmental effects in Canada of the U.S. portion of the proposed pipeline which do not interact with the effects of the Canadian portion of the pipeline to create cumulative effects, the Panel will further consider whether, and how, it will consider those transboundary effects. At this time the evidentiary record in relation to those effects has not been developed.

Economic Feasibility

A number of questions were raised regarding gas supply, specifically the long-term supply of natural gas to be transported on the proposed Project. One concern that was mentioned frequently was that gas supply to the proposed Project would be routed through the U.S., and existing trade agreements may adversely affect the future availability of gas to Canada. Various presenters requested that the Applicant demonstrate that it has a secure supply of gas for the lifetime of the proposed Project. An interest was expressed in "ensuring a reliable, cost-effective, and adequate supply of both natural gas and electricity on Vancouver Island for both current and future needs." Several presenters expressed concerns about the volatility of the commodity price of natural gas and its potential impact on both the availability of supply to the proposed Project, and its impact on electricity prices to consumers.

The Panel considers that these are issues related to the outlook for long-term demand for natural gas in the markets to be served by the proposed Project and the outlook for long-term supply of gas available to the proposed Project. These matters are contemplated in Issue 1 of the initial List of Issues.

Marine Issues

Many presenters identified concerns regarding the potential environmental effects of the proposed construction and operation of the offshore portion of the proposed Project on the marine environment and species. Specific concerns included effects on marine parks and ecological reserves, fish and fish habitat, marine mammals, species at risk, benthic invertebrates, and cumulative environmental effects.

Satellite Channel was identified as a sensitive marine ecosystem. For example, Parks Canada has proposed a National Marine Conservation Area for this region and Ecological Reserve 67 (ER67) is located south of Cape Keppel on Saltspring Island. The Panel heard from many presenters that ER67 is the only fully protected marine area and, because the proposed Project may have impacts to ER67, this area should not be disturbed. The legal implications of placing a pipeline or other industrial use within ER67 were a concern. Some presenters asked if the boundaries could be moved or the legislation amended to permit a pipeline. Routing the proposed Project north of ER67 and along the sloped seabed off Cape Keppel was considered by some as undesirable. They view this area as one of the most ecologically diverse locations within Satellite Channel. Issues related to construction challenges and potential slope failures were identified, including the possibility that construction debris would slide down the slope into ER67. Some presenters favoured the idea of routing through ER67 as they saw it more environmentally desirable and technically the least challenging. On the other hand, others wanted the proposed Project to avoid the area all together, including both ER67 and Cape Keppel.

With respect to the proposed National Park and National Marine Conservation Area, issues identified included potential impacts to flora and fauna; visitor use and enjoyment and safety; function and structure of the marine ecosystem; and the need for scientifically-rigorous baseline data on all aspects of marine ecology in the area. Many presenters saw the proposed Project as incompatible with the principles of a marine protected area.

Several presenters acknowledged the Orca Pass Marine Stewardship proposal through which the proposed Project would pass.

Comments were made about the unique nature and function of the Islands Trust to preserve and protect the environment, features and amenities of the trust area encompassing approximately 5200 square kilometers and overlapping the proposed Project area.

Several presenters stressed the need to effectively manage waste associated with the Project and the need to implement contingency plans.

Concerns were raised regarding potential effects of the proposed Project during construction, operation, and decommissioning on marine mammals and other marine wildlife and their habitats. Effects to whales that were highlighted could include direct mortality, interference with communication, feeding, and navigation. Noise generated during construction and operation of the Project was a concern expressed by presenters. More information from the Applicant was requested on the effects of the Project on whale hearing and echolocation. It was suggested that noise impact modeling for whales, dolphins and fish be undertaken for construction and operation phases of the Project. Concerns were also raised regarding contingency plans for the avoidance of marine mammals during construction.

Presenters were concerned with the lack of baseline information in relation to both commercial and non-commercial marine invertebrates. Dungeness crabs, shrimp, geoduck clams, and other shellfish were among the species discussed. Dungeness crabs, their movement, migration, and distribution; barrier effects; reef effects; predator effects; construction methods; population effects; and size of crabs were discussed. Concerns were raised that the construction methods to be used should be further scrutinized. For example, different construction methods were considered to affect the rate of sediment in-filling. The effectiveness of the concrete mattresses was also brought into question.

Due to the lack of adequate baseline data cited by many presenters, the possibility of many unknown and unpredicted effects was raised. Suggestions were made that the Applicant undertake studies at different times of the year.

Concerns regarding the potential thermal effects of the Project were also identified as a potential environmental issue.

Considerable interest was expressed in potential effects to fish and fish habitats (e.g., lingcod, rock fish and other bottom fish) that could be caused by the proposed Project. Direct effects to habitat and indirect effects from resuspended sediments and water quality were of concern. For example, effects on eel grass beds and its impact to salmon staging areas were also identified as concerns. Concerns with the present state of fisheries populations were identified and questions were raised on how the proposed Project may affect those populations. It was also stated that the different construction methods could have differing impacts on fish and their habitats. Several presenters requested that the Panel ensure sufficient baseline data is gathered so that impacts on the distribution and abundance of harvested species can be assessed. Should blasting be carried out, presenters had additional concerns, such as the effects on marine life.

Potential fishing grounds for bald eagles, which were identified in Boundary Pass, and the effects of the construction and operation of the Project on those grounds were identified as a concern.

The Panel was urged to adopt the Precautionary Principle when dealing with marine environmental issues.

The Panel was also encouraged by several presenters to pursue the possibility of holding a technical conference to discuss marine environmental issues.

The Panel considers the above-mentioned marine issues to be covered in Issue 2 of the initial List of Issues.

Horizontal Directional Drill (HDD)/Landfall Issues

The HDD proposal at the Manley Creek landfall on Vancouver Island raised several issues of concern for presenters. The feasibility of a directional drill was brought into question. It was suggested that contingency plans should receive close scrutiny and, should the HDD fail, c onsiderable mitigation would be required. It was questioned whether the HDD plan had already received approval from the federal Department of Fisheries and Oceans. Specific environmental concerns related to the sensitivity of the area, effects on the seabed in the vicinity of the HDD, potential toxicity of drilling muds, how mud waste would be disposed of, and the appropriateness of using local groundwater to supply water for the HDD were raised. Species of concern identified in the HDD corridor included geoduck clams.

The Panel considers these are issues related to the potential environmental effects of the proposed Project, as identified in Issue 2 of the initial List of Issues.

Terrestrial Issues

The Panel heard an extensive list of concerns during the sessions with respect to environmental issues related to hydrology and water quality. These concerns included potential effects on local aquifers due to breaches or contamination, contamination of adjacent water wells, use and discharge of water as a result of construction activities, and other effects on local water quantity and quality.

A number of presenters discussed agriculture-related concerns such as the effect of pipeline construction on agricultural practices, including: disturbance and compaction of agricultural soils; mixing of topsoil and subsoil; effects on drainage; weed control; and endangerment to livestock.

Additional terrestrial environmental issues identified related to the loss of vegetation as a result of clearing and the effectiveness of reclamation. A concern was raised regarding the fragmentation of several mature second or old growth habitats. This habitat is becoming increasingly rare on the east coast of Vancouver Island and a concern was raised that the loss of vegetation would take years to regenerate. Presenters indicated that surveys completed to date have identified numerous species at risk in the area. Presenters also noted, in the context of cumulative effects, that pipeline construction would remove forested habitats, and fragment remaining larger patches of forest habitat.

The possible existence of a heron rookery near Garnet Road, possibly near the HDD landfall at Manley Creek was mentioned. The need for protection and safeguarding of this rookery was stressed. Also the potential effects on raptors were highlighted as a consideration due to their importance for biodiversity. Recommendations that the Applicant undertake an owl survey were also made.

Potential effects to fish and fish habitat of pipeline construction, operation, maintenance and decommissioning on terrestrial watercourses were identified as areas of concern. Similarly, presenters also indicated that stream crossings and access roads that affect direct and indirect fish habitat values should be assessed. The issue of potential effects to fish was raised with respect to the potential for leakage from or explosion of the proposed Project.

As with marine issues, the Panel considers terrestrial issues to fall within Issue 2 of the initial List of Issues.

Routing and Location

Several presenters who own farmland in the Project area stated that they wanted to be actively involved in routing decisions and raised issues related to the proposed pipeline route and the impact on land requirements. Concerns included:

- the route chosen is simply a cheap way to go as it involves dealing with fewer people;
- the route is illogical and adds further challenges to farmers;
- the strategy of running the proposed pipeline through small farms should be re-examined;
- the routing through areas of low population density has no regard for the impact on the farmers whose land is affected;

if the Project was to proceed as proposed, it should be done in a manner that minimizes infringements on the enjoyment of homes and properties; and
the current route of the proposed pipeline runs through several mature second growth or old growth habitats.

As previous mentioned, many presenters also identified concerns with the proposed route as it passes through unique environmental areas within Georgia Strait.

The Panel considers that issues related to the route of the proposed Project fall within Issue 4 set out as "land requirements" and "routing and location" in the initial List of Issues, and, therefore, they will be considered by the Panel.

Socio-Economic Matters

Residents, farming operations, a school and other businesses located near the Project area rely on aquifers for water. Concerns were raised about the effects from the proposed Project on these aquifers and water wells due to breaches or contamination associated with Project construction. Presenters stated that the Applicant's information regarding impacts to the aquifer was lacking. It was mentioned that should this water supply be contaminated, the water users would have to rely on, and absorb the cost of, trucked water. A concern was also expressed that the proposed Project would cross an existing water line and would require appropriate mitigation. It was suggested that the Applicant provide a bond to cover any potential damage to the water line resulting from the proposed Project. With regard to the requirement for local supply of water during construction, questions were raised regarding the appropriateness of using local groundwater for the HDD at Manley Creek and also the effect on local water quantity and quality from the use and discharge of water for other construction activities.

Some presenters noted that the Gulf Islands are a unique marine environment and offer many recreation and tourism opportunities that may be jeopardised. Presenters discussed the potential impact the Project may have on marine protected areas such as the proposed National Marine Conservation Area and ER67. Additionally, the impact that the proposed Project would have on recreational opportunities along the terrestrial route, in areas such as Cherry Point Beach, Manley Park and other local parks and walkways, was raised as a concern.

A number of presenters talked about the impacts which the proposed Project would have on the quality of life for residents in the area. Many presenters noted that they had moved to the area because of the clean air, natural beauty and safe surroundings. They expressed concern that the proposed Project would compromise these positive qualities and they would not be able to enjoy their homes and their property as they do now.

Some presenters raised concerns about the impact which the proposed Project could have on the commercial fishery in the Georgia Strait due to the environmental impacts on crabs, other invertebrates and various types of harvested fish. The Panel was requested to examine options to mitigate potential impacts to harvested species.

Some parents and the Principal of the Evergreen Independent School expressed their concern to the Panel that, since the proposed pipeline is routed 138 metres from the school, it could have the following impacts. First, a gas pipeline located so close to a school in a seismic area could pose safety concerns for its students. Second, as the school relies on the aquifers discussed above, the availability of potable water could be affected by pipeline construction. Finally, the future

economic viability of the school could be in jeopardy, as parents may choose to send their children elsewhere for fear that this school is no longer a safe environment for their children.

A couple of presenters talked about the need for a reliable supply of energy to Vancouver Island to meet the needs for future economic development in the "high tech" sector.

The Panel notes that the above socio-economic issues will be addressed primarily under Issue 2 of the initial List of Issues, however, aspects of these issues are also covered under Issues 3, 4 and 5.

Accidents and Malfunctions

Concerns were raised regarding the potential for accidents and malfunctions which may have adverse effects on the environment and residents. Concerns were expressed in relation to the effect of the environment on the Project, in particular natural disasters such as seabed mobility, earthquakes and tsunamis.

The Panel notes that all of these concerns would be addressed with respect to environmental effects, Project design and public safety, Issues 2 and 5 of the initial List of Issues. For that reason, no further amendment to the List of Issues was required.

Operation and Abandonment of Facilities

Some presenters expressed concerns relating to the safety and environmental effects of operation, decommissioning and abandonment of the proposed facilities. These issues are covered by Issues 2, 3 and 5 in the initial List of Issues. The Panel's Terms of Reference include, as part of the Project description, "construction, operation, decommissioning and abandonment of" the proposed pipeline and related facilities. However, it should be noted that any decommissioning or abandonment activities would also be subject to future examination under the NEB Act and, consequently, under the CEA Act, at that time.

2.0 Clarification of the List of Issues

Project Financing and Corporate Structure

Many presenters wanted clarification of the corporate structure of the Applicant. This concern was captured in the question "who will earn what and who will be responsible for what?" Concerns were expressed regarding the financial arrangements of the Applicant, their effect on the Applicant's ability to deal with the economic demands of decommissioning or accidents and the economic viability of the Project in case of cost overruns.

To ensure these concerns are fully addressed, the Panel has modified the initial List of Issues by including a further reference in Issue 1, Economic Feasibility, to "project financing with reference to the corporate structure of the Applicant and financial arrangements with related parties."

Landowners and Communities

The Panel heard from a number of local farm operators. These farmers were primarily concerned about the restrictions that would be placed on how they could use the right-of-way. Concerns were expressed regarding impacts to drainage systems; construction and maintenance of fence lines; subsoil and cultivation; and the need to modify normal farming practices. For example, it was noted that load restrictions could make it impossible for them to move heavy machinery or

full loads of manure or silage over the right-of-way because pipeline companies limit the weight of a truck to 20,000 pounds.

Several presenters raised issues related to the 30 metre safety zone located adjacent to the proposed pipeline right-of-way. Landowners directly affected by the proposed right-of-way and landowners adjacent to the right-of-way were concerned that the 30 metre safety zone would limit the use and enjoyment of their home and property without compensation. They were also concerned that they would have to seek permission from the Applicant every time they wanted to carry out routine farming activities such as building a fence or digging an irrigation ditch in the 30 metre safety zone. To the extent that they do not involve matters directly related to compensation, the Panel considers issues related to potential impacts of the safety zone and the operation of farm practices fall within Issue 2, as they relate to socio-economic impacts, and Issue 3, both in the initial List of Issues. However, for greater certainty, and in light of the strong concern expressed by many of the presenters regarding these issues, the Panel has amended Issue 3 to specifically refer to "the potential impact of the 30 metre safety zone" and "the potential impact on farming operations."

Safety and Design

Safety issues and concerns were presented at all of the public consultation sessions. Of particular concern was the location of the proposed Project in the proximity of populated areas, parks, the Evergreen Independent School and the Skeleem Village institutional facility. Other locations that focused concerns included pipeline crossings of roads, agricultural lands, the Malahat highway, water pipelines, the Chevron terminal, ferry and other marine traffic routes, and the routing near Cape Keppel and ER 67. Crossings of agricultural lands raised concerns with the limits and impacts on equipment size and weight, drainage systems and ditch maintenance. The feasibility of, and contingency plans for, the proposed HDD landfall at Manley Creek were also issues raised by several presenters.

Engineering criteria concerns referenced the list of standards to be used, fracture control program, critical crack length, spacing of automated emergency shutdown valves and mainline block valves, the pipe wall thickness and the pipe burial depth. Requests to examine the use of double wall or "pipe in pipe" in the design were made. Presenters identified numerous design elements to be considered, including:

- seismic activity;
- tsunamis;
- landslides;
- rockslides;
- slope failures;
- turbidity currents;
- seabed mobility; and
- other geohazards.

Operational safety concerns included the remote location of the operations center in the U.S. and the absence of Project staff on Vancouver Island. Of particular concern was the ability to monitor, detect and react quickly to Project upsets, leaks and breaks. Concerns were also raised by some presenters with regard to the reliability and the viability of the Applicant, which they characterized as a "shell" company, to safely construct and operate the proposed Project over its

design life. Presenters also questioned the safety record of the pipeline industry as a whole and provided recent examples of incidents.

Emergency response planning, consultation with response agencies and the response capability of local organizations were concerns expressed for both the terrestrial and marine portions of the proposed route. The scenarios presented included the high potential for fire hazards in wooded areas during dry summer periods. Many presenters requested additional information on emergency response, specifically on how the public would be allowed to have input into the development of these plans, when the plans would be available for public review, and how the Applicant would ensure that local resources and first responders have sufficient capability to meet any potential incidents.

Security and protection of the proposed facilities from terrorist or third party activity was another concern. The repair time of submarine and terrestrial portions of the proposed Project was raised in the context of security of gas and electricity supply for Vancouver Island.

Presenters also raised the following issues:

- marking and signage along the proposed Project route;
- the takeaway capacity and need for expansion of the Centra B.C. pipeline system to provide service to the proposed Project;
- the impact on, and potential pollution of, local aquifers with respect to construction and maintenance methods; and
- the behaviour and fate of the natural gas in the event of a break or rupture along the terrestrial and marine portions of the proposed route.

Presentations indicated a need to ensure cradle-to-grave safety considerations for the proposed Project by examining the corporate safety management systems as well as the quality assurance programs. Establishment of acceptable levels of risk and risk assessment of the proposed Project in terms of safety of the public, the worker and the environment was considered essential by several presenters for specific locations along the route or for the entire proposed route. A request was made for an analysis to determine the potential consequences of a catastrophic failure in populated and environmentally sensitive areas. It was suggested that the Applicant prepare an operations safety case similar to those required in the North Sea.

The Panel considers all these matters fall within Issue 5 - "The safety and the design of the proposed facilities." However, for purposes of clarity the Panel has modified and expanded the wording to state "the safety of the design, construction, operation and emergency response planning for the proposed Project, including the potential for the occurrence of and consequences of failures, malfunctions or accidents."

3.0 New Issues

First Nations Issues

The Panel attended two sessions to hear presentations regarding First Nations issues specifically. However, First Nations issues were not limited to these sessions alone.

An important issue raised by many First Nations presenters was that, although First Nations had met with BC Hydro[1] on a number of occasions, they considered these meetings to be for the purpose of collecting information and they did not satisfy the Crown's obligation to consult with First Nations. They informed the Panel that no government department had initiated any such consultation meetings with them to date.

First Nations noted that the proposed Project is routed through their traditional territory and would impact the way they have used their territory since time immemorial. Some First Nations stated that this could have an effect on their Douglas Treaty rights and others stated that it could affect their aboriginal rights and title to the land and waters. First Nations asked the Panel to consider whether or not approval of the proposed Project would be a justified infringement on aboriginal rights and title. First Nations also commented that the "no net loss" principle would not be appropriate mitigation.

First Nations are concerned about the effect the proposed Project could have on both the terrestrial and marine environments. Specific concerns related to impacts on archeological sites, traditional territory, and access to and cumulative effects on their traditional territory. As well, First Nations were concerned about traditional land use, specifically potential changes to hunting, gathering and fishing activities in the proposed Project area.

It was stated that Boatswain Bank on Vancouver Island and Cape Keppel on Saltspring Island are particularly important areas for First Nations. Concerns were expressed about the impacts to endangered Weathervane scallops, various bottom fish, oysters, clams and salmon as these represent a food source to the First Nations. First Nations also expressed concerns about potential impacts that the proposed Project could have on species they consider endangered, as well as those designated by federal or provincial agencies.

The initial List of Issues does not specifically encompass many of the concerns raised by First Nations. Therefore, the Panel has amended the List of Issues to add Issues 8 and 9 as follows:

- the adequacy of consultation with First Nations regarding the proposed Project; and
- the potential impact of the proposed Project on First Nation communities, traditional use activities, and their treaty and aboriginal interests.

Financial Risk and Liability

A number of presenters expressed concern about the ability of the Applicant to deal with financial liabilities, such as those arising from seismic events. They felt strongly that the initial List of Issues should be expanded to specifically include the areas of insurance, liability and risk management related to pipeline accidents, ruptures and/or failures. Some presenters suggested that the Applicant be required to provide a financial guarantee for any potential future damages or liability.

To address these concerns, the Panel considers it appropriate to add Issue 10 to the List of Issues:

- the ability of the Applicant to manage risk and financial liabilities related to the construction, operation, and decommissioning of the proposed Project, and pipeline failures, malfunctions and accidents.

[1] BC Hydro conducted meetings with First Nations as representatives for the Applicant.

4.0 Issues Not Added to the List of Issues

Some issues were raised that the Panel has determined will not be included in the List of Issues for the GH-4-2001 hearing. The issues include:

- concerns with the existing Centra B.C. system;
- potential privatization of BC Hydro;
- regional taxation; and
- issues pertaining to landowner compensation.

These issues are discussed below.

Many presenters requested the Panel to include in its review the safety and design of the existing Centra B.C. system. The concern expressed was that the existing system might not be built to withstand potential seismic events in the coastal areas of B.C. In such a situation, presenters were concerned that gas from the proposed Project would compound safety issues for local residents in the event of an earthquake.

A number of presenters noted that BC Hydro could be privatized in the future and expressed concerns that privatization could result in electrical supply problems similar to those experienced in California this past year. Furthermore, presenters recommended that the Panel hearings be adjourned until the issue of privatization is resolved.

The appraisal and taxation of the proposed Project in regional districts and municipalities was also identified as an issue that the Panel should examine.

Some presenters suggested that the purpose of the proposed Project would be to allow gas to be moved to the U.S. from offshore B.C., if the moratorium on offshore hydrocarbon development is lifted and offshore development occurs. The Application before the Panel does not include this possibility. If the proposed Project were approved and constructed, a reversal of gas flow would require a future application to the National Energy Board (NEB). As with all applications, the NEB would conduct a full examination of any such application before deciding on the public convenience and necessity of the application.

Other presenters suggested that the List of Issues should include the effect of emissions from the upstream gas wells. As the source of the gas for the proposed Project is a market hub, the Panel considers th , issue too remote to warrant specific inclusion in the List of Issues.

The Panel notes that some of these issues are matters within provincial and local jurisdiction. In the Panel's view, all of these issues are either hypothetical, of questionable relevance, or remote from the application before the Panel. As a result, they will not be included in the List of Issues.

A few presenters suggested that the Panel set aside its examination of the proposed Project until after the B.C. government has sorted out its energy policy. The Panel notes that it has an obligation to examine the Project before it and, therefore, declines the request to adjourn this proceeding.

Issues with respect to compensation for restrictions on farming operations within the right-of-way and the 30 metre safety zone were raised. The Panel notes that the NEB Act does not provide for the involvement of the Panel, or the NEB, in determining compensation for the use of land or for damage that results from the construction of the proposed Project. These compensation claims

are ultimately handled by the Minister of Natural Resources Canada. However, the NEB Act does provide for negotiation and/or arbitration. Sections 88 and 89 set out the procedure for negotiation proceedings, and sections 90 through 103 set out the procedures for arbitration. Any request for negotiation and/or arbitration should be sent to the Honourable Herb Dhaliwal, Minister of Natural Resources, at 580 Booth Street, Ottawa, Ontario, K1A 0A6.

5.0 Issues Requiring Additional Comment

Many presenters in the public consultation sessions including: individuals; groups; non-government organizations such as the David Suzuki Foundation; and government departments including Environment Canada asked the Panel to include the greenhouse gas emissions resulting from the combustion of the gas transported by the proposed Project as an issue on the List of Issues. Some presenters focused their attention on the environmental and health effects of all emissions from the ultimate burning of the gas while others asked the Panel to specifically examine the emissions from the existing Campbell River ICP facility and the proposed new g eneration facilities. Some presenters were especially concerned with the effects associated with particulate matter. Many of these presenters said that the purpose of the proposed Project was not to transport gas to Vancouver Island but to generate electricity. The proposed Project they said was more than a tube of steel. Therefore, in their view, the emissions from the associated generation facilities should be included in the Panel's assessment of the environmental effects of the proposed Project. The environmental effects from the generation facilities, they said, would be environmental effects tied to the purpose of the proposed Project. Others were of the view that the overall emissions from the use of the gas generally should be considered.

The Panel heard many recommendations that it undertake a lifecycle analysis of the proposed Project, which would include the environmental and health effects of burning the gas as well as an assessment of how this would meet the goals of the Kyoto Protocol. Counsel for the Applicant took the position that this Panel could not consider those matters. He also took the position that the Applicant was not practically able to provide information on those matters in any event, as it was not the proponent of the generation facilities. The Applicant is a subsidiary of BC Hydro and Power Authority and is the general partner of the GSX Canada Limited Partnership. The proponents of the proposed generation facilities are BC Hydro and Power Authority, and Calpine Canada. The owner of the existing Campbell River facilities is Calpine Canada.

The Province of B.C. provided a written submission dated 23 January 2002 which indicated that the province "has wide responsibility with respect to energy policy, and clear legislative authority with respect to energy facilities in the province." In the province's view, the GSX Canada Pipeline Panel Review process is not the appropriate forum to assess generating facilities located on Vancouver Island, or to review provincial energy policy. The Province and other presenters indicated that another process for submissions was required before the Panel could consider whether to include those matters in the List of Issues.

In light of these positions, this Panel determined that a formal comment process is necessary before it can decide whether or not these issues, or any of them, can be included for consideration as issues in the hearing. Therefore it will seek the comments of parties on the following questions:

(1) Under the CEA Act or under the NEB Act, or both, does this Panel have the authority to consider the environmental effects of:

- the combustion of the gas proposed to be transported;
- the combustion of the gas at the existing Campbell River ICP facility; and
- the combustion of the gas at the proposed new generation facilities?

(4) If this Panel has the authority to consider these environmental effects, should it consider them?

A separate letter setting out these questions will be sent to counsel for the Applicant and copied to intervenors to the GH-4-2001 hearing seeking their comments on the questions posed. Subsequent to the close of this comment process, the Panel will then further consider this matter and determine whether there will be any subsequent amendment to the List of Issues.

1.05 Closing Remarks

During the public consultation sessions numerous participants presented thoughtful and concerned views to this Panel about the future energy path of their province. Many of the consultations were held in rooms packed with concerned Canadians eager to share their views on the importance of the wise use of energy resources. As well, several presenters reminded this Panel of the responsibility that comes with its appointment. While the Panel is aware that it may not have the ability to consider some of the matters raised by presenters within the mandate it has been given, it does have the ability to reflect the comments of the public in the Joint Panel Report it will prepare under the CEA Act. The Panel intends to capture these comments in that report so that they may be shared with others.

Many presenters and intervenors requested that the Panel obtain certain additional information from the Applicant. The Panel has initiated its response to these requests by drafting some information requests for the Applicant. The Panel notes that it is continuing its examination of the proposed Project, and will issue further requests for information of the Applicant and intervenors.

Throughout the public consultation process, the Panel received a number of questions regarding process and access to information. If you would like to obtain the Directions on Procedure concerning the proposed GSX Canada Pipeline Project public hearing (Hearing Order GH-4-2001), please telephone Mr. Guy C. Hamel, Regulatory Officer, toll free at 1-800-899-1265. You may obtain other related information from the National Energy Board website, www.neb-one.gc.ca. Please click on "Regulatory Update" and then "GSX Canada Pipeline Project." You can obtain further information by visiting the Canadian Environmental Assessment Agency website at www.ceaa-acee.gc.ca. The Panel notes that it will consider applications for late intervention, however, they should be accompanied by reasons.

Yours truly,

Michel L. Mantha
Secretary to the Joint Review Panel
GSX Canada Pipeline Project

List of Issues

The Joint Review Panel has identified, but does not limit itself to, the following issues for consideration in the hearing:

1. The economic feasibility of the proposed GSX Canada Pipeline having regard to, among other things:
   - the outlook for long-term demand for natural gas in the markets proposed to be served by the proposed pipeline;
   - the outlook for the long-term supply of natural gas available to be transported on the proposed pipeline;
   - the ability of the proposed GSX Canada Pipeline Project to attract volumes to its system over the long term; and
   - **project financing with reference to the corporate structure of the Applicant and financial arrangements with related parties.**

2. The potential environmental and socio-economic effects of the proposed GSX Canada Pipeline Project including those factors set out in subsections 16(1) and 16(2) of the *Canadian Environmental Assessment Act* as described below:
   - the environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
   - the significance of the effects referred to in the paragraph above;
   - comments from the public that are received during the review;
   - measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
   - the purpose of the Project;
   - alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means;
   - the need for, and the requirements of, any follow-up program in respect of the Project;
   - the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future;
   - need for the Project;
   - alternatives to the Project;
   - a description of the present environment which may reasonably be expected to be affected, directly or indirectly, by the Project, including adequate baseline characterization;
   - measures to enhance any beneficial environmental effects; and
   - proposal for contingency and emergency response plans.

3. The potential impact on landowners and communities affected by the selected route of the proposed pipeline, **including:**
   - **The potential impact of the 30 metre safety zone; and**
   - **The potential impact on farming operations.**

4. The appropriateness of the routing and location of the proposed facilities, land requirements and land rights acquisition process.

5. The safety **of** the design**, construction, operation and emergency response planning for the proposed Project, including the potential for the occurrence of and consequences of failures, malfunctions or accidents**.

6. The reasonableness of the proposed tolling methodology.

7. The terms and conditions to be included in any certificate which may be granted.

8. **The adequacy of consultation with First Nations regarding the proposed Project.**

9. **The potential impact of the proposed Project on First Nation communities, traditional use activities, and their treaty and aboriginal interests.**

10. **The ability of the Applicant to manage risk and financial liabilities related to the construction, operation, and decommissioning of the proposed Project, and pipeline failures, malfunctions and accidents.**

Note: ***All text appearing in bold indicates additions to the initial List of Issues and all text that has been struck out has been deleted from the initial List of Issues.***

National Energy Board

Office national de l'énergie

File 3200-G49-1
31 May 2002

To: Parties to the GH-4-2001 Proceeding

Georgia Strait Crossing Pipeline Limited (GSX PL)
GSX Canada Pipeline Project - Hearing Order GH-4-2001
Oral Argument on Motion

Introduction

By application dated 24 April 2001 Georgia Strait Crossing Pipeline Limited (GSX PL or the Applicant) applied pursuant to Parts III and IV of the *National Energy Board Act* (the NEB Act) for a Certificate of Public Convenience and Necessity and for related orders, respecting the GSX Canada Pipeline, the Canadian portion of the Georgia Strait Crossing Project.

The Georgia Strait Crossing Project is a proposed international pipeline that would originate at Sumas, Washington, and transport natural gas to Vancouver Island, British Columbia. The GSX Canada Pipeline, would be approximately 60 km of 406 mm OD (16 inch) pipe commencing at a point on the Canada/United States border in Boundary Pass, east of Saturna Island, British Columbia to an interconnection with a Centra Gas British Columbia Inc. (Centra) pipeline at a point west of Shawnigan Lake on Vancouver Island. Centra would deliver the gas to the ultimate users on Vancouver Island.

The GSX Canada Pipeline would include mainline block valves, a line block valve/blow-off assembly, an excess flow control valve, a check valve, a separator, pig-receiving equipment and liquid handling/storage equipment located at the Centra interconnection. In addition it would include a Supervisory Control and Data Acquisition (SCADA) system linking the above facilities to control centres, as well as permanent access roads, a communication system and a power supply as may be required. The GSX Canada Pipeline would have an initial design capacity of approximately 2.71 10^6 m^3 (95.7 MMcf) of natural gas per day. Prior to the filing of the application under the NEB Act, the National Energy Board (the NEB or the Board) referred the GSX Canada Pipeline project to the Minister of the Environment for referral to a review panel under the *Canadian Environmental Assessment Act* (CEA Act). On 4 October 2000 the Minister announced the referral of the proposal to a panel review and by agreement dated 15 August 2001 the NEB and the Minister of the Environment agreed to establish a joint review panel with a mandate under both the NEB Act and the CEA Act.

On 20 September 2001 the Joint Review Panel (the Panel) was announced and on 9 November 2001, the Panel issued Hearing Order GH-4-2001 setting out the Directions on Procedure to be followed for the hearing of the application by the Panel.

Public consultation sessions were held between 11 and 19 January 2002 to obtain comments from the public on which issues the Panel should consider during the hearing and what further information should be obtained from the Applicant. Numerous presenters asked the Panel to include the environmental effects of the emissions resulting from the combustion of the gas transported by the proposed pipeline in

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the List of Issues to be considered in the hearing. Other presenters focused on the environmental effects of the emissions that would result from the burning of the gas at the existing Campbell River co-generation facility and the proposed new generation facilities. Both of these facilities, the Applicant advised, would be recipients of the gas proposed to be transported.

A written submission dated 23 January 2002 was received from the Province of British Columbia indicating that the generation facilities are within the legislative authority of the Province. Both the Province of British Columbia and other submitters suggested that a further, more formal process was required before the Panel could decide whether the environmental effects of the combustion of some or all of the gas could be considered during the course of the hearing. During the public consultation session held on 17 January 2002 in Victoria, British Columbia, counsel for GSX PL made a statement in relation to these proposed issues and objected to their inclusion in the List of Issues.

As a result of these submissions, the Panel decided to institute a comment process before determining whether any of these issues would be included in the List of Issues for consideration in the hearing. The Panel asked the parties to address the following specific questions:

(1) Under the *Canadian Environmental Assessment Act* or under the *National Energy Board Act*, or both, does this Panel have the authority to consider the environmental effects of:

- the combustion of the gas proposed to be transported;
- the combustion of the gas at the existing Campbell River ICP facility; and
- the combustion of the gas at proposed new generation facilities?

(2) If this Panel has the authority to consider these environmental effects, should it consider them?

The Panel also drew to the attention of parties the requirements of section 57 of the *Federal Court Act*, as compliance with those requirements might be necessary if responses to the questions posed involved constitutional considerations.

The timetable for submissions was subsequently amended to allow for the filing of affidavit evidence and the notification of all of the Attorneys General pursuant to section 57 of the *Federal Court Act*. Submissions closed on 22 March 2002 and, at the request of several parties, the Panel set down two days of oral argument in Sidney, British Columbia for 9 and 10 April, 2002. In addition to the Applicant, submissions or statements of interest were received from fourteen other parties. Both the Provinces of British Columbia and Alberta participated in the process. In total, ten parties participated in the oral argument.

Parties making submissions represented a wide range of interests, including aboriginal groups, federal departments, provincial governments, consumers' groups, concerned individuals, and environmental organizations.

The Panel has read and carefully considered all of the submissions received and wishes to thank all parties who participated for their thoughtful and helpful comments.

Facts

GSX PL proposes to construct and operate the GSX Canada Pipeline. GSX PL is the general partner of GSX Canada LP, a limited partnership, whose partners are GSX Holdings Limited (a subsidiary of British Columbia Hydro Authority) and WGP International (Canada) Inc., an affiliate of Williams Gas Pipeline Company (Williams). Powerex Corp. (Powerex), the power marketing subsidiary of British Columbia Hydro Authority (BC Hydro), has entered into a precedent agreement with GSX PL and contracted firm transportation capacity of approximately 99 TJ/day on the GSX Canada Pipeline for a term of 30 years. The GSX Canada Pipeline would transport natural gas to the Centra pipeline which would deliver it to markets on Vancouver Island. Approximately 90 TJ/day of the gas would be provided to the co-generation facility at Campbell River and a proposed new generation facility, previously planned for Port Alberni and now being considered for Duke Point. Other markets may be served by the pipeline, including future generation projects and the increased natural gas demands of residential, commercial and industrial customers on the island.

The Island Co-Generation Project (ICP) facility at Campbell River is a natural gas fired, combined cycle co-generation facility. It is designed to generate an average of 245 megawatts of electricity for sale to BC Hydro and to co-generate process steam (up to 135 tonnes/hour) for use by the adjacent Elk Falls Pulp and Paper Mill. The ICP facility is intended to operate as a base load generation facility. It requires about 45 TJ of natural gas each day. It was scheduled to begin commercial operation in May 2001.

The proposed new generation facility, which is being considered for Duke Point, would involve the construction of a natural gas fired 260 megawatt generation plant. It would be operated as a base load facility continuously delivering electricity to BC Hydro. Like the Campbell River ICP facility, it would require a natural gas supply of about 45 TJ/day. The proponents of the proposed new generation facility are BC Hydro and a company referred to in argument and in the application as "Calpine".

The Applicant states that the natural gas requirements of the Campbell River ICP facility and the proposed new facility, totaling about 90 TJ/day, will ensure that the GSX Canada Pipeline is utilized at a high annual load factor. The GSX Canada Pipeline, with both its initial and possible future expansion capacity, would also be available to transport natural gas for delivery to other markets, including the core market on Vancouver Island, the Vancouver Island Gas Joint Venture (VIGJV) comprising seven large pulp and paper mills, and other possible generation projects. The Applicant stated that additional natural gas fired generation may be required on Vancouver Island by 2007, with a fuel demand of up to 110 TJ/day.

In order to transport natural gas from the terminus of the GSX Canada Pipeline to the ICP facility and Duke Point generation projects, Powerex intends to enter into a long term transportation agreement with Centra with firm contract demands totaling 90 TJ/day, 45 TJ/day for each facility. Centra will not have to expand the capacity of its existing mainline pipeline facilities on Vancouver Island to accommodate Powerex's firm service requirements.

The Province of British Columbia has been involved in matters concerning the supply of energy to Vancouver Island. As a result of a provincially-led process, the Province directed BC Hydro to enter into negotiations for an electricity purchase agreement with the Campbell River ICP facility proponents. In addition, it directed BC Hydro to negotiate a key principle agreement with the proponents of the proposed Port Alberni Generation project. The provincial government also approved BC Hydro's request

to enter into negotiations with Williams and to form a partnership, namely GSX Canada LP, to apply to the NEB to construct the GSX Canada Pipeline project.

The 245 megawatt Campbell River ICP facility was reviewed by a project committee pursuant to the *British Columbia Environmental Assessment Act*. In the course of that assessment, greenhouse gas (GHG) emissions were considered, in addition to other potential environmental effects. The proponents of the ICP facility agreed to specific environmental management commitments and plans and to develop a GHG mitigation plan. Pursuant to the *British Columbia Environmental Assessment Act*, environmental assessments are conducted for all power plants of 50 MW or greater. In the event that a generating facility of 50 MW or greater is proposed in the future for Vancouver Island, the environmental effects of that generating station would be evaluated under the environmental assessment process of the Province of British Columbia.

None of the parties contested that the burning of natural gas results in emissions, particularly emissions of carbon dioxide, described as a GHG. As a result of concerns about GHG effects on climate change, Canada signed the Kyoto Protocol (the Protocol) on 29 April 1998. The purpose of the Protocol is to obtain a reduction in the emission of GHGs. To date, Canada has not ratified the Protocol.

GSX PL, in its application, states that the GSX Canada Pipeline will generate numerous benefits for natural gas suppliers and consumers and for the Province of British Columbia. These benefits include: "increase the security of natural gas supply to Vancouver Island by using a different pipeline corridor to the Island"; "provide employment, business, and procurement opportunities in British Columbia"; and "generate additional tax revenue for the Province".

Submissions of the Parties

GSX PL was of the view that the Panel was precluded from considering the environmental effects of the emissions of the ultimate burning of the gas. Furthermore, GSX PL submitted, the Panel should not consider those environmental effects. The consideration of those effects should be left with the provincial regulators. To do otherwise, it argued, would be non-productive and would result in unnecessary duplication. GSX PL also noted that the consideration of those effects would present practical difficulties in relation to both the filing and testing of evidence.

Both the Province of British Columbia and the Province of Alberta argued that the Panel could not and should not consider the environmental effects of the combustion of the gas to be transported, either in general or at the Campbell River ICP facility or at the proposed new generation facility. First, the environmental effects of the combustion of the gas to be transported were not included in the Terms of Reference for the Joint Review Panel as matters to be considered by the Panel. Second, the province has authority over downstream uses of the gas to be transported and there is no linkage to a federal power under the *Constitution Act*. Particular authority under the *Constitution Act* has been given to the provinces to regulate generation facilities. In the result, they argued, the Panel has no jurisdiction to consider the environmental effects of downstream use. Furthermore, to deny the proposed GSX Canada Pipeline on the basis of the environmental effects of the combustion of the gas would be, in effect, a regulation of provincial facilities. In summary, they submitted that it would be an unjustified and unwarranted intrusion into provincial areas of jurisdiction for this Panel to consider the effects of the downstream combustion of gas, either under the CEA Act or under the NEB Act. Even if such jurisdiction were present, they stated, there are compelling reasons why the Panel should not exercise its jurisdiction to consider those effects.

BC Gas Utility Ltd.'s submission generally supported the views of both the Province of British Columbia and the Province of Alberta.

Other parties, for a variety of reasons, argued that the Panel both could and should consider the environmental effects of the burning of the gas to be transported. Some argued that the Terms of Reference that established the Joint Review Panel were broad enough to permit the inclusion of those effects in the assessment to be undertaken pursuant to the CEA Act. Those effects could be considered as a result of the manner in which the project was scoped by the Minister of the Environment, or pursuant to a consideration of the environmental effects of the project including its cumulative effects. It was also submitted that the Panel could consider the environmental effects of the combustion of the gas as the Terms of Reference included a consideration of the comments of the public.

A number of intervenors provided detailed analyses of the relevant case law on the ability of a body exercising a federal power to take into consideration matters not directly within federal jurisdiction. They noted the difference between regulating within provincial jurisdiction and taking matters within provincial jurisdiction into account when making a decision within federal jurisdiction. The Panel, they said, would not be regulating within the provincial sphere if it considered the environmental effects of the combustion of the gas, but merely taking relevant considerations into account when making a decision properly within federal jurisdiction.

It was argued that the principles arising from international treaties should inform the sound exercise of the Panel's discretion, even when a treaty has not been implemented, as is the case with the Protocol. Compliance with such solemn undertakings was, itself, a matter within the public interest. It was also argued that the emissions from the burning of the gas were subject to federal jurisdiction in any event.

Others submitted that the environmental effects of the combustion of the gas would have to be considered as the Panel was required pursuant to the existing List of Issues to consider the "potential impact of the proposed project on First Nation communities, traditional use activities, and their treaty and aboriginal interests." As well, the burning of the gas would have effects on First Nations who are subject to federal jurisdiction, and therefore there was a sufficient link to a head of federal power to enable the Panel to consider those effects.

Some intervenors raised concerns with the overall energy policy of British Columbia and the issues tied to the production of GHG and climate change. The GSX Canada Pipeline, they submitted, represented a fundamental shift in the energy strategy for Vancouver Island.

The Panel does not propose to set out all of the arguments raised by parties here, but will touch upon relevant points in the course of its views on the questions posed.

Views of the Panel

The place to commence the analysis of the questions posed to the parties is with the NEB Act, as it is the application under that legislation that then engages the CEA Act and triggers its assessment requirements.

The *National Energy Board Act*

Under the NEB Act, the Applicant seeks the issuance of a certificate pursuant to section 52 which states:

> The Board may, subject to the approval of the Governor in Council, issue a certificate in respect of a pipeline if the Board is satisfied that the pipeline is and will be required by the present and future public convenience and necessity and, in considering an application for a certificate, the Board shall have regard to all considerations that appear to it to be relevant, and may have regard to the following:
>
> (1) the availability of oil, gas or any other commodity to the pipeline;
> (2) the existence of markets, actual or potential;
> (3) the economic feasibility of the pipeline;
> (4) the financial responsibility and financial structure of the applicant, the methods of financing the pipeline and the extent to which Canadians will have an opportunity of participating in the financing, engineering and construction of the pipeline; and
> (5) any public interest that in the Board's opinion may be affected by the granting or the refusing of the application.

No party challenged the constitutional validity of this section of the NEB Act or the ability of the Province to regulate the downstream generation facilities. Rather, the question is whether, within the ambit of this section, the Panel can consider the environmental effects of the ultimate combustion of the gas to be transported by the GSX Canada Pipeline. At issue is the ability of the Panel when making a determination whether a federally-regulated pipeline is in the public convenience and necessity to consider the environmental effects of emissions, including those from provincially-regulated generation facilities.

In support of their view of the exclusive role of the Provinces in relation to electrical generation facilities, the Provinces referred to the Supreme Court of Canada decision in *Ontario Hydro* v. *Ontario (Labour Relations Board)*, [1993] 3 S.C.R. 327. In that case, La Forest J. commented on the development of section 92A of the *Constitution Act* as a response to provincial insecurity about their jurisdiction over resources within the province. He noted that this insecurity arose from the possible threat under section 92(10)(a) of a transformation of provincial generation enterprises into federal undertakings due to their connection with facilities extending beyond the province. While this background is of interest, that case dealt with an ability to regulate employees who are employed on or in connection with nuclear generation facilities and is not relevant here.

The question before this Panel is not its ability to regulate, but rather its ability to consider certain environmental matters. The Panel is of the view that the difference between the exercise of a legislative power, i.e. "regulation", and the factors that can be considered in exercising that power, i.e. "consideration", is crucial to the approach taken to the first question. Much of the constitutional case law cited by the parties is concerned with the ability or inability of one level of government to exercise its legislative authority. This case law is not directly on point with the situation before this Panel. It is nevertheless helpful for what it says about the ability of one level of government to affect matters within the jurisdiction of another level of government. For that reason we will refer to it.

In *Union Colliery Co. of B.C.* v. *Bryden*, [1899] A.C. 580, the Judicial Committee of the Privy Council of England considered legislation enacted by the Province of British Columbia that provided that no Chinese could be employed in underground work. The Privy Council found that the leading feature of the enactment was its application to Chinese who were aliens or naturalized subjects. As the legislation, in pith and substance, consisted in establishing a statutory prohibition which affected aliens or

naturalized subjects, it thereby trenched upon the exclusive authority of the Parliament of Canada and was *ultra vires*. Simply put, the Courts have generally held that one level of government cannot legislate within the jurisdiction of another level of government.

With the development of more modern and varied legislative schemes by both levels of government, the Courts have had to examine situations where the facts were more complex. In *Proprietary Articles Trade Association* v. *Attorney General for Canada*, [1931] 2 D.L.R. 1, the Judicial Committee of the Privy Council considered certain provisions of the federal *Criminal Code* and the *Combines Investigation Act*. In the course of its reasons it stated [at p. 12]:

> If then the legislation in question is authorized under one or other of the [federal] heads specifically enumerated in s. 91, it is not to the purpose to say that it affects property and civil rights in the Provinces. Most of the specific subjects in s. 91 do affect property and civil rights but so far as the legislation of Parliament in pith and substance is operating within the enumerated powers there is constitutional authority to interfere with property and civil rights.

The question of the *vires* of the *Combines Investigation Act* was also considered by the Supreme Court of Canada in *General Motors of Canada Ltd.* v. *City National Leasing Ltd.*, [1989] 1 S.C.R. 641. At para. 45 et seq., the Court said:

> In determining the proper test it should be remembered that in a federal system it is inevitable that, in pursuing valid objectives, the legislation of each level of government will impact occasionally on the sphere of power of the other level of government; overlap of legislation is to be expected and accommodated in a federal state...The above comments also emphasize that the question...of how far federal legislation may validly impinge on provincial powers is one part of the general notion of the 'pith and substance' of legislation; i.e., the doctrine that a law which is federal in its true nature will be upheld even if it affects matters which appear to be a proper subject for provincial legislation (and vice versa).

The Court goes on at para. 45 to adopt the comments of Professor Hogg, author of *Constitutional Law of Canada* (2nd ed. 1985), where he states that "the provincial enumerated powers have exactly the same capacity as the federal enumerated powers to 'affect' matters allocated to the other level of government."

In the recent decision of *Kitkatla Band* v. *British Columbia (Minister of Small Business, Tourism and Culture)*, [2002] S.C.J. No. 33, the Court noted that constitutional questions should not be discussed in a factual vacuum. When discussing a division of powers case, rights need to be asserted and their factual underpinnings demonstrated. In undertaking a division of powers analysis the impugned law must be characterized to determine the head of power within which it falls; a "pith and substance" analysis. In undertaking such an analysis the purpose of the legislation and its legal and practical effects on the jurisdiction of the other level of government are considered.

From the case law it is clear that legislation may be validly enacted by one level of government and still have an effect on or intrude into matters within the jurisdiction of another level of government. What is important is the "pith and substance" of the exercise of legislative power, and that can only be determined upon a detailed analysis that examines the relevant facts and effects in each case. This case law on the ability to exercise legislative power is helpful as it demonstrates the willingness of the Courts

to follow a flexible and practical approach in each case and their view that the constitution is not comprised of watertight compartments. However, as already noted, no party actually contested the constitutionality of section 52 of the NEB Act.

More directly on point is the case law that has examined the ability of a body making a decision or exercising its authority within its jurisdiction to consider matters within the jurisdiction of another level of government. There are several cases that have addressed this issue.

In the case of *Canadian National Railway Co.* v. *Nakina (Township)* (1986), 69 N.R.124 [hereinafter *Nakina*], the Federal Court of Appeal considered a similar question under the *Railway Act*.[1] In that case, the Canadian National Railway Company (CN) applied to the Canadian Transport Commission for a "run-through" and consequent closing or abandonment of the station at Nakina. At a hearing of the application, the Corporation of the Township of Nakina appeared and presented evidence and argument on the effect of the proposal on the economy of the region. The Commission found that it may consider the public interest in deciding whether or not to grant the requested leave. However it was uncertain how broadly it should define the public interest, i.e. should it examine only those aspects of the public interest that impact directly on railway operations or were all aspects of the public interest relevant? The Commission determined that it was not entitled to take into consideration the effects of a run-through on the Township of Nakina.

The Court overturned this decision saying it found the conclusion "startling". It went on to note that, while the *Railway Act* gives the Commission special responsibilities in technical operation, safety and service, it was not limited to a narrow consideration of only those matters when making a decision. Those three matters did not themselves constitute either a limitation or a definition of what the public interest is. The Court found that evidence dealing with the probable economic effects of the proposed changes on the surrounding communities would be relevant to the question of the public interest.

A similar approach was taken by La Forest J. in *Friends of the Oldman River* v. *Canada*, [1992] 1 S.C.R. 3. At issue in that case was the applicability of the *Environmental Assessment Review Process Guidelines Order*, SOR/84-467 [hereinafter EARPGO] to a provincial dam project in Alberta. The constitutionality of the EARPGO was put into question. In the course of his reasons for the majority, La Forest J. commented on the difference between exercising a legislative power and the considerations that can be taken into account when exercising that power.

First he noted that the environment is a diffuse subject, and is not an independent matter of legislation under the *Constitution Act, 1867*. It does not comfortably fit within the existing division of powers without considerable overlap and uncertainty. Both levels of government in exercising their legislative powers can affect the environment either by acting or not acting. He then examined the regulation of federal railways and stated that considerations within provincial jurisdiction, such as economic benefits and local wetlands, can be taken into account when deciding whether to grant the final approval of a railway. He said at para. 88:

> To suggest otherwise would lead to the most astonishing results, and it defies reason to assert that Parliament is constitutionally barred from weighing the broad environmental

[1] It is worth noting that both the *Railway Act* and the NEB Act were enacted under section 92(10)(a) of the *Constitution Act 1867*, and the NEB Act was modeled after the earlier *Railway Act*.

> repercussions, including socio-economic concerns, when legislating with respect to decisions of this nature.

La Forest J. highlighted the difference between "consideration" and "regulation" in his subsequent analysis. In paragraph 90, he discussed how a power may be actually exercised, i.e. "regulation". In the case of the federal fisheries power there is an ability to actually regulate in what would otherwise be provincial areas of jurisdiction as the federal power involves the management of a resource. However the exercise of the power must be appropriately linked to the federal head of power as was demonstrated in two fisheries cases, *Fowler* v. *R.* [1980] 2 S.C.R. 213 and *Northwest Falling Contractors Ltd.* v. *R.* [1980] 2 S.C.R. 292. The provision in the first case was found to be so broad as to be *ultra vires* while the provision in the second case was appropriately linked to the federal fisheries power and was *intra vires*.

At paragraph 92, La Forest J went on to discuss what may be "considered" when exercising a federal legislative power. He states:

> There is, however, an even more fundamental fallacy in Alberta's argument, and that concerns the manner in which constitutional powers may be exercised. In legislating regarding a subject, it is sufficient that the legislative body legislate on that subject. The practical purpose that inspires the legislation and the implications that body must consider in making its decision are another thing. Absent a colourable purpose or a lack of bona fides, these considerations will not detract from the fundamental nature of the legislation. A railway line may be required to locate so as to avoid a nuisance resulting from smoke or noise in a municipality, but it is nonetheless railway regulation.

La Forest J.'s analysis in this decision of what can be considered by a body when making a decision within its jurisdiction was further developed by the Supreme Court of Canada in the case of *Québec (Attorney General)* v. *Canada (National Energy Board)*, [1994] 1 S.C.R. 159 [hereinafter *Québec*]. In issue in that case was the ability of the Board to attach environmental conditions related to future electricity production facilities to a licence to export electricity. Those conditions required compliance with federal standards and the successful completion of existing environmental review processes. While no constitutional question was posed, the Court noted that it must delineate the jurisdiction of the Board in a manner that respects constitutional concerns.

The parties disputed whether the Board was entitled to consider, as relevant to its decision whether to grant the export licences, the environmental impact of the construction by Hydro-Québec of those future facilities. The Court found that "ultimately it is proper for the Board to consider in its decision making process the overall environmental costs of granting the licence sought" [para. 56]. It went on to note in paragraphs 59 and 60:

> Obviously, while matters relating to export clearly fall within federal jurisdiction according to s. 91(2) of the Constitution Act, 1867, as part of the federal government power over matters relating to trade and commerce, it is undeniable that a proposal for export may have ramifications for the operation of provincial undertakings or other matters under provincial jurisdiction.
>
> In defining the jurisdictional limits of the Board, then, this Court must be careful to ensure that the Board's authority is truly limited to matters of federal concern. At the

> same time, however, the scope of its inquiry must not be narrowed to such a degree that the function of the Board is rendered meaningless or ineffective...

It added in para. 62:

> If in applying this Act the Board finds environmental effects within a province relevant to its decision to grant an export licence, a matter of federal jurisdiction, it is entitled to consider those effects. So too may the province have, within its proper contemplation, the environmental effects of the provincially regulated aspects of such a project. This co-existence of responsibility is neither unusual nor unworkable.

While stating that the Board has the power to consider environmental factors which appear to it to be relevant, the Court recognized that some parameters must be put around the ability of the Board to consider matters within provincial jurisdiction. The Court discussed the need for a connection between the export application and the production facilities whose environmental effects may be subject to assessment. To determine if there was the necessary connection, the question to ask was whether the construction of the new facilities was required to serve, among other needs, the demands of the export contract. With an affirmative answer to that question, the environmental effects of the construction of the facilities were related to the export and it became appropriate for the Board to consider the source of the electrical power to be exported, and the environmental costs associated with that generation. The Court also stated in paragraph 66 that the Board could not undertake a "wholesale review of the entire operational plan of Hydro-Québec" under the guise of a consideration of related environmental effects. The Court as well noted the unique sphere each level of government has when undertaking an assessment of the environmental effects of the generation facilities. The Board was the forum in which the environmental impact attributable solely to the export would be considered.

From this case law it is apparent that a federal body making a decision within its proper sphere of federal jurisdiction may take into consideration matters within provincial jurisdiction. The test is not the same "pith and substance" test used when deciding the constitutionality of the exercise of a legislative power. There is no question, and no party disputed, that the Panel can determine whether the proposed GSX Canada Pipeline is in the present and future public convenience and necessity. The question to be determined is what matters the Panel can take into consideration when making its decision. Those matters must be found by the Panel to be relevant to its decision-making. The decision to consider them must not spring from a colourable purpose or a lack of bona fides. From a constitutional perspective the consideration of those matters may affect matters of provincial jurisdiction. In the Panel's view, it is quite simply a question of balance that must be determined on the facts in each case.

With this background analysis, we will turn to a consideration of the relevant legislation and the facts in this case. Under section 52 of the NEB Act, the Board considers applications for the construction and operation of pipelines over 40 km. in length. Pipelines, by their very nature, convey both burdens and benefits. It is the responsibility of this Panel to weigh those burdens and benefits to determine the public convenience and necessity, a test that the Court noted in *Nakina* is "most general". In the course of determining the public convenience and necessity, section 52 provides that the Panel "shall have regard to all considerations that appear to it to be relevant, and may have regard to...any public interest that in the Board's opinion may be affected by the granting or the refusing of the application."

While the public convenience and necessity test is very broad, there are several specific matters that the legislation provides that the Panel may consider, including the availability of markets, actual or potential,

for the gas proposed to be transported. In this case the markets will be within the Province of British Columbia, with the majority of the gas to fuel two generation facilities that are subject to provincial jurisdiction. In fact, the benefits to the Province and its citizens were specifically noted by the Applicant in its application, including that of increased provincial tax revenue. The Panel notes that there was no suggestion by the Provinces that consideration should not be given to those provincial benefits when the Panel considers the public convenience and necessity. Indeed, in the Panel's view, if the Board did not consider the benefits related to matters within provincial jurisdiction when making a public convenience and necessity determination under section 52, very few pipelines would ever be constructed. It is only logical that with the ability to consider the benefits that may result from a pipeline approval goes the concurrent ability to consider the detriments that could result from such an approval.

From the case law it is clear that when determining whether the pipeline is in the public convenience and necessity the Panel must, bona fide and without a colourable purpose, decide what it sees as relevant to its determination. It may consider matters that are within provincial regulatory jurisdiction if it bona fide considers them to be relevant to its determination. So long as it avoids colourability, such as the "wholesale review" warned against in *Québec*, taking provincial matters into consideration is likely constitutionally appropriate.

Participants appearing at the public consultation sessions and intervenors who filed submissions in relation to the questions posed by this Panel asked the Panel to consider the environmental effects of the combustion of the gas to be transported at all or some of the facilities that would utilize it as fuel. Of primary concern to many of these participants and intervenors were the GHG emissions that result from the burning of natural gas. The possible effect those emissions could have on the global climate was raised by many of them. They noted that the federal government has not ratified the Protocol and there is no federal or provincial regulatory scheme for the control of GHG emissions. They asked this Panel to, directly or indirectly, assume that role. Some of them sought a consideration and review of the entire energy strategy for British Columbia.

The mandate or role of this Panel under the NEB Act is to consider matters relevant to an application for a certificate of public convenience and necessity to construct and operate the GSX Canada Pipeline. To do so it must determine which of the environmental effects of concern to the participants and intervenors are relevant to its consideration of the public convenience and necessity under section 52 of the NEB Act.

The Panel turns first to the new generation facility that was to be constructed at Port Alberni and is now being considered for Duke Point. It is a specific proposed facility that will be built to burn a significant proportion of the gas to be transported by the proposed pipeline. While the facility has been planned and certain steps have been taken toward realizing those plans, it has not been constructed. The environmental assessment of this facility has not been completed. This facility is a part of an overall plan by BC Hydro, through various corporate relationships and partnerships with others, to build and operate an international pipeline from Washington State to Vancouver Island, purchase gas for transportation to Vancouver Island on the pipeline, enter into a 30 year contract for 100% of the transportation capacity of the pipeline and thereby ensure the delivery of the gas as feedstock to a new generation facility. Furthermore, it will construct and operate the facility and, as part of this plan, it will then sell the electricity generated.

The facts in this case indicate that the construction of this proposed generation facility is directly linked to the application before this Panel. A consideration of the environmental effects of the combustion of

the gas at the plant could inform the ultimate decision to be taken by this Panel. Furthermore, the possible probative value of the information obtained when compared to the exercise necessary to obtain that information can justify its inclusion in the hearing process. Therefore, a consideration of the environmental effects of the combustion of the gas to be burned at the proposed new generation facility is relevant to the pipeline application presently under consideration.

Having found these effects relevant to its determination, the Panel must decide if their consideration is constitutionally permissible. It is the Panel's view that such a consideration is constitutionally permissible. The Province argues that a refusal of the certificate of public convenience and necessity will result in the de facto regulation by this Panel of provincial generation facilities. This argument misses the point. First, this Panel notes that it is always open to the Province and BC Hydro to build an intraprovincial pipeline to Vancouver Island and fuel the proposed generation facility without the proposed GSX Canada Pipeline. Second, and more importantly, as a result of the consideration of matters within federal jurisdiction, the Province could refuse to approve the proposed generation facility thereby exercising a similar form of control over a proposed federal international pipeline. Both levels of government have the ability to affect the project that is subject to the other's regulatory jurisdiction but this does not constitute *ultra vires* regulation. Simply put, a consideration of this matter by the Panel is not an unwarranted intrusion into provincial affairs. There is no "wholesale" review of provincial energy policy or the entire operating plans of BC Hydro as was warned against in *Québec*. Rather there is simply the normal inter-play and accommodation between two levels of government each of whom has the ability to take into consideration relevant matters that touch on the other's jurisdiction and control.

In summary, the Panel will include the environmental effects of the combustion of the gas at the proposed new generation facility in the List of Issues to be considered for the hearing of the GSX Canada Pipeline application.

The Panel has reached a different conclusion in relation to the emissions from the Campbell River ICP facility. That facility is owned and operated by Island Co-Generation Project Inc. and has been subject to a provincial environmental assessment process. It is constructed and is in the process of being commissioned for operation. Its ongoing operation is not contingent on the granting of the GSX PL application. Presumably it will continue to operate if the GSX Canada Pipeline were never built. It is capable of operating at full capacity regardless of the GSX Canada Pipeline. It has a contract for the supply of gas through the existing Centra system. The evidence indicates that the construction of the GSX Canada Pipeline would result in the supply of 17 TJ/day of that gas changing from an interruptible commitment to a firm commitment.

With the construction of the GSX Canada Pipeline the demand of the facility for gas will not change but the source of supply for the gas may change. The facility is existing, has been subject to an assessment and does not require the construction of the proposed pipeline to operate. In the Panel's view, therefore, a consideration of the environmental effects is not relevant to the determination that must be made by the Panel under section 52 of the NEB Act. An examination of the environmental effects of the combustion of gas at the ICP facility would not advance the Panel's inquiry on the question of whether the GSX Canada Pipeline is in the public convenience and necessity.

Furthermore, the exercise necessary to explore those issues outweighs the probative value such evidence would have to the Panel's ultimate determination. Therefore the Panel will not consider the environmental effects of the combustion of the gas at the Campbell River ICP facility.

Future facilities for which there are no plans in place at this point in time are too speculative and uncertain to be relevant to the Panel's consideration of the application before it.

Some parties asked the Panel to consider the environmental effects of the burning of all of the gas that would pass through the GSX Canada Pipeline. They suggested that the emissions of GHG could be calculated regardless of where the gas was combusted. As noted above, the GSX Canada Pipeline connects with the Centra system, a local distribution system, where it may displace gas from the existing Centra line presently serving the Victoria area. On any given day the gas may be transmitted to various residential, industrial, commercial and public facilities in addition to the generation plants described. It is difficult, if not impossible, to know where those facilities are located or their relevant circumstances. A focused and valid assessment of the environmental effects is not feasible. In the Panel's view, calculating the GHG emissions of combustion regardless of the site of the combustion would not be helpful to the determination it must make. For example, the use of gas in some of those facilities could be ultimately beneficial to air quality depending on the fuels that it may replace.

Considering the environmental effects of the combustion of the gas at all of the facilities where it may be burned would be a difficult exercise of little, if any, probative value. It is too broad, too speculative and of too little utility to be useful for the section 52 determination to be made by this Panel. The Panel is of the view that a consideration of the environmental effects of the burning of all of the gas to be transported by the pipeline is not relevant to the decision it must make in this case.

The *Canadian Environmental Assessment Act*

The Panel must also examine its responsibilities under the CEA Act to determine whether the environmental effects of the combustion of the gas can be considered under that statute. Those effects could be considered if they come within the scope of the project that is subject to assessment or if they are included in the factors to be considered in the assessment.

Scope of the Project

When a project is to be assessed by a review panel, section 15(1) of the CEA Act requires that the Minister of the Environment, after consulting with the Responsible Authority (in this case the Board), determine the scope of the project in relation to which an environmental assessment is to be conducted. The scope is set out in the *Agreement Between the National Energy Board and the Minister of the Environment Concerning the Review of the GSX Canada Pipeline Project* dated 15 August 2001. In the Appendix to this Agreement, the Terms of Reference state that the "Joint Review Panel will conduct a Review of the environmental effects of the Project and the appropriate mitigation measures based on the Project Description provided under Part I.."

Part I of the Appendix, the Project Description, states:

> Undertakings proposed by the Proponent or likely to be carried out in relation to the physical works proposed by the Proponent, including:
>
> Construction, operation, decommissioning and abandonment of,
>
> - approximately 59.9 km of 406 mm O.D. natural gas pipeline (approximately 44.3 km offshore and 15.6 km onshore) from a point on

the Canada - United States border in Boundary Pass roughly midway between the east end of Saturna Island (BC) and the west end of Patos Island (WA) to an interconnection with the existing Centra Gas British Columbia Inc. (Centra) pipeline at a point west of Shawnigan Lake on Vancouver Island, south of Duncan;

- mainline block valves located just landward of the Vancouver Island shoreline and at an intermediate point between the landfall and the Centra interconnection;
- a line block valve/blow off assembly, an excess flow control valve, a check valve, a separator, pig receiving equipment, liquid handling/storage equipment and Multiple Address System (MAS) radio equipment (including a free standing tower approximately 44 m in height) located at the Centra interconnection;
- a Supervisory Control and Data Acquisition (SCADA) system linking the above facilities to control centres;
- permanent access roads, communications system and power supply as may be required to service mainline valve sites and other pipeline facilities; and
- various temporary construction workspace, equipment laydown areas, and access roads.

The Terms of Reference do not state that the end use of the gas is a specific undertaking included in the scope of the project. Therefore, for the end use of the gas to be included in the scope of the project, it would have to be a component of one of the elements of the project as described in the Terms of Reference. The Panel must examine whether the end use of the gas comes within the phrase "undertakings proposed by the Proponent or likely to be carried out in relation to the physical works proposed by the Proponent including: construction, operation, decommissioning and abandonment" of the described physical works.

Section 15(3) of the CEA Act reads as follows:

> Where a project is in relation to a physical work, an environmental assessment shall be conducted in respect of every construction, operation, modification, decommissioning, abandonment or other undertaking in relation to that physical work that is proposed by the proponent or that is, in the opinion of
>
> (a) the responsible authority, or
>
> (b) where the project is referred to a mediator or a review panel, the Minister, after consulting with the Responsible Authority,
>
> likely to be carried out in relation to that physical work.

The Minister's Terms of Reference used the language of section 15(3) of the CEA Act so the Panel may look to the case law judicially considering that section to provide guidance.

The two leading cases regarding sections 15 and 16 of the CEA Act are *Bow Valley Naturalists Society* v. *Canada (Minister of Canadian Heritage)*, [2001] 2 F.C. 461 (F.C.A.) [hereinafter *Bow Valley*] and

Friends of the West Country Ass'n v. *Canada (Minister of Fisheries and Oceans)*, [2000] 2 F.C. 263 (F.C.A.) [hereinafter *West Country*]. Both of these cases address situations where the Responsible Authority determined the scope of the project in relation to which an environmental assessment was to be conducted. At issue were the limits on the discretion of the Responsible Authority to scope a project. In contrast, in this case the Minister has determined the scope of the project and the Joint Review Panel is interpreting the Terms of Reference. The Panel cannot change the scope of the project which has already been fixed by the Minister. As noted by one of the Parties in argument, the Minister provides his "marching orders" to a Panel in the Terms of Reference. Despite this difference between these cases and the facts before the Panel, the cases are helpful as they define the language used in subsection 15(3).

In *Bow Valley*, at paragraph 34, the Federal Court of Appeal, relying in part of the *West Country* decision, concluded:

> It would thus appear that the "scope" of a project under section 15 is normally limited to undertakings directly related to the proposed physical work, such as its construction and operation, and ancillary or subsidiary undertakings.

In considering the meaning of subsection 15(3), the Federal Court of Appeal stated in paragraphs 19 and 20 of *West Country*:

> 19. The words "in relation to" in subsection 15(3) might be read in the abstract to contemplate any construction, operation, modification, decommissioning, abandonment or other undertaking that has any connection, no matter how remote, to the physical work which is the focus of the project as scoped. [page278] However, such an interpretation would ignore the context of sections 15 and 16 and the logical reason for the words "in relation to" in subsection 15(3). The first contextual point is that the responsible authority is required to scope the project under subsection 15(1). This would be an unnecessary exercise if, under subsection 15(3) every other construction, operation, modification, decommissioning, abandonment or other undertaking that had even a remote connection to the project had to be the subject of the environmental assessment. Second, paragraph 16(1)(a) provides for a cumulative effects analysis taking account of the project as scoped under subsection 15(1) in combination with other projects or activities that have been or will be carried out. This portion of paragraph 16(1)(a) would be redundant if projects or activities outside the project scoped under subsection 15(1) had to be considered under subsection 15(3).
>
> 20. The words "in relation to" are used in the definition of "project" in subsection 2(1) and in subsection 15(3) instead of the word "of". However, if the word "of" was used, the environmental assessment would be limited to the construction, operation, modification, decommissioning or abandonment of the physical work itself. Where a physical work is being constructed, there may be ancillary construction--for example, something as major as a coffer dam required to hold back water where the construction of a bridge required work on a river bed, or of a lesser order, such as the construction of temporary living quarters for construction workers. The words "in relation to" in context here do not contemplate any other construction, operation, modification, decommissioning, abandonment or other undertakings that has (sic) any conceivable connection to the project as scoped. Rather the words refer to construction, operation, modification, decommissioning, abandonment or other undertakings that pertain to the

> life cycle of the physical work itself or that are subsidiary or ancillary to the physical work that is the focus of the project as scoped.

At paragraph 22 the Court concluded that once the project was scoped under subsection 15(1), "subsection 15(3) did not require that the environmental assessment include construction, operation, modification, decommissioning, abandonment or other undertaking outside the scope of the projects."

In light of this case law the Panel must determine whether the combustion of the gas to be transported comes within any of the terms "construction", "operation", "decommissioning" or "abandonment" of the described physical works, i.e. the pipeline facilities. If the combustion of the gas does not come within those specific terms, then does it fall within the phrase "undertakings proposed by the Proponent or likely to be carried out in relation to the physical works proposed by the Proponent"?

In the facts of this case, the combustion of the gas clearly does not fall within the "construction", "decommissioning", or "abandonment" of the pipeline. It was suggested in argument that the combustion of the gas was a part of the "operation" of the pipeline. However, there is no application by GSX PL to combust gas, but rather an application to transport it. In the Panel's view, the "operation" of the GSX Canada Pipeline entails the transportation of the gas, not the combustion of that gas at electrical generation facilities, or in homes and businesses. As a result, the combustion of the gas does not come within the term "operation" of the GSX Canada Pipeline facilities.

The next question is whether the combustion of the gas comes within the phrase "undertakings proposed by the proponent or likely to be carried out in relation to the physical works proposed by the Proponent". According to the Courts, such an "undertaking proposed by the proponent" must pertain to the life cycle of the pipeline and undertakings "in relation" to the pipeline are to be "ancillary" or "subsidiary". As noted above in *West Country*, the Court found that undertakings ancillary to or subsidiary to the construction of a bridge could include the dam required to hold the water back during bridge construction or the temporary living quarters needed for the workers. The road from the bridge or the forestry operations that would result from the construction of the bridge were found by the Court not to fit within the requirements of s. 15(3).

As a result of this case law, the combustion of the gas would not be an "undertaking proposed by the Proponent or likely to be carried out in relation to" the proposed pipeline. The combustion of the gas does not pertain to the life cycle of the applied-for pipeline nor is it ancillary or subsidiary to the pipeline as the Courts have defined those terms. Just as the bridge in *West Country* allowed the transportation of equipment used in forestry operations, the proposed pipeline allows the transportation of gas to be used in electrical generation. In both instances those operations are outside the scope of the project.

In conclusion, the Minister has determined pursuant to section 15(1) of the CEA Act the scope of the project in relation to which an environmental assessment is to be conducted. The combustion of the gas is not included amongst the specific elements of the project described by the Minister nor does the combustion fall within the ambit of the "[other] undertakings" set out in the Terms of Reference.

Factors to be Considered

While a consideration of the environmental effects of the combustion of the gas has not been clearly included for consideration in the Terms of Reference, parties argued that there is a further indirect way that those effects could be considered under the CEA Act. This could happen if such effects are included

in a consideration of the factors already described in section 16 of the CEA Act and set out in the Terms of Reference. The Terms of Reference require that the Panel include in its review of the project consideration of the factors identified in Part II of the Appendix. Part II states:

Factors to be Considered During Review

The Review will include a consideration of the following factors listed in subsections 16(1)(a) to (d) and 16(2) of the CEAA:

1. The environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
2. The significance of the effects referred to in paragraph 1;
3. Comments from the public that are received during the Review;
4. Measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
5. The purpose of the Project;
6. Alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means;
7. The need for, and the requirements of, any follow-up program in respect of the Project; and
8. The capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future.

In accordance with subsection 16(1)(e) of the CEAA, the assessment by the Joint Review Panel will also include a consideration of the following additional matters:

9. Need for the Project;
10. Alternatives to the Project;
11. Description of the present environment which may reasonably be expected to be affected, directly or indirectly, by the Project, including adequate baseline characterization;
12. Measures to enhance any beneficial environmental effects; and
13. Proposal for Contingency and Emergency Response Plans.

All of those factors must be considered by the Board. Parties submitted that a consideration of several of these existing factors would involve a consideration of the environmental effects of the combustion of the gas. First, those effects could be considered to be part of the environmental effects of the Project as referred to in factor number 1. Second they could be part of a consideration of the cumulative effects of the project, a consideration also required pursuant to the first factor. Finally, they could be part of the consideration of the purpose of, need for and alternatives to the project as required in factors 5, 9 and 10.

In the Panel's view it is premature to determine what will be considered in relation to the factors of cumulative effects and purpose of, need for and alternatives to the project. However, as Parties raised these issues the Panel will deal with them briefly. Each of these possibilities will be considered in turn.

Environmental Effects

Factors 1 to 8 of Part II of the Appendix are drawn directly from sections 16(1) and 16(2) of the CEA Act. A consideration of "the environmental effects of the Project" is mandatory under section 16(1) of the CEA Act and the Minister was required to include it in the Terms of Reference. Parties have suggested that the Panel can include in its consideration of the "environmental effects" the effects of the combustion of gas proposed to be transported. They argue that it is an environmental effect related to the project under consideration.

The scope of the project does not include the generation facilities nor any other facilities for the combustion of the gas. To expand the definition of environmental effects to include the effects of combustion would in essence expand the scope of the project as set by the Minister. Such an approach would permit the Panel to override the scope of the project established by the Minister under section 15 of the CEA Act. It is the Panel's view that this cannot have been the intention of section 16. When sections 15 and 16 are read together, it is clear that the environmental effects to be considered must be the environmental effects of the project as scoped. Subject to our comments below on cumulative effects, the term "environmental effects" cannot include the environmental effects of other facilities not contained within the scope of the project.

Cumulative Effects

Next, the Panel has been asked to determine whether the combustion of the gas falls within "any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out". Again, because the Terms of Reference used the language of section 16 of the CEA Act, the Panel may turn to the case law judicially considering that section to provide guidance.

Both *West Country* and *Bow Valley* considered the question of how to undertake a cumulative effects assessment. In *West Country* at paragraph 34 the Court noted that the consideration of cumulative effects involves a consideration of the effects of both the project as scoped and of the effects from sources outside that scope, unrestrained by a perception of constitutional jurisdiction. The Court in *Bow Valley*, in paragraph 41, noted that the effects of the scoped project need be considered only in conjunction with the effects of other projects or activities which have been or will be carried out. Uncertain or hypothetical projects or activities need not be considered.

From this case law it is clear that a consideration of the environmental effects of the combustion of the gas could possibly be included in the Panel's consideration of cumulative effects if the necessary criteria were met. First there would need to be an environmental effect of the project as scoped. That effect would need to act in combination with the environmental effects of other projects that have been or will be carried out and must be likely to result in cumulative environmental effects.

The information filed in the application of GSX PL did not describe any cumulative environmental effects likely to result from the environmental effects of the GSX Canada Pipeline in combination with the environmental effects of specific projects or activities that will burn the gas to be transported and have been or will be carried out. The Panel has requested further information on air quality from the Applicant in Information Request 7.51 and expects that during the hearing process the record will develop in relation to the likelihood of cumulative effects. During or at the conclusion of the hearing process a determination will be made by the Panel whether the environmental effects of the proposed

pipeline act in combination with the environmental effects of the combustion of some or all of the gas to be transported and whether cumulative environmental effects are likely to result. Lastly, the Panel notes that the issue of cumulative effects is already included in the List of Issues.

Purpose Of, Need For, Alternatives To

The third way in which the environmental effects of the combustion of the gas could be considered within the factors set out in the Terms of Reference is as part of the consideration of the purpose of, need for and alternatives to the project, factors 5, 9 and 10. The Panel notes that the issue of what evidence will be considered in relation to those factors did not form a part of the questions posed to the Parties. That issue was addressed in the Panel's correspondence of 31 January 2002 where it outlined its decisions resulting from the January 2002 public consultation sessions. In that letter the Panel noted that pursuant to the CEA Act and the Terms of Reference it was required to consider the purpose of, need for and alternatives to the project. Under the NEB Act those issues could also arise pursuant to section 52. The Panel pointed out that neither the Terms of Reference nor section 52 require that the Applicant demonstrate that the alternative proposed by the Applicant is environmentally the most benign alternative.

The Panel did not determine what constituted the purpose of, need for or alternatives to the GSX Canada Pipeline but noted that they were included in the List of Issues and that the evidence on them can develop during the course of the hearing. Therefore, it remains to be determined whether some information in relation to the environmental effects of the combustion of the gas will be necessary as a result of a consideration of the purpose of, need for and alternatives to the pipeline. The Panel notes that the Terms of Reference do not specifically require it to consider the environmental effects of those factors. As stated in its 31 January 2002 letter, if parties see a consideration of these factors as requiring a detailed examination of the entire provincial energy policy and energy strategy for B.C., they will need to demonstrate to this Panel during the course of the hearing process that it has the necessary jurisdiction to undertake such a review and the relevance of such an examination to the project being considered by the Panel.

Conclusion

In summary, the Panel has determined that a consideration of the environmental effects of the combustion of the gas at the proposed new generation facility is relevant to its determination under section 52 of the NEB Act. While the Panel has determined that this matter is relevant to the proceeding before it, it has not determined what weight it will be given. That question is not now before this Panel and was not a part of the questions posed to the Parties. The weight to be given to this evidence will be determined by the Panel during the course of the proceeding or upon its conclusion. This issue will be added to the List of Issues to be considered during the hearing of this matter.

Furthermore, under the CEA Act there are two areas where the environmental effects of the combustion of the gas might be considered by the Panel. First, the environmental effects of the combustion of the gas to be transported may ultimately be included in the Panel's consideration of cumulative environmental effects of the GSX Canada Pipeline. Whether the effects of the combustion of the gas will act cumulatively with the effects from the pipeline is not clear at this time. The record will likely be further developed on that issue and the Panel may need to determine the likelihood of the occurrence of cumulative effects resulting from the environmental effects of the pipeline and those of projects or

activities that will burn the gas to be transported and which have been or will be carried out. The issue of the cumulative effects of the GSX Canada Pipeline has already been included in the List of Issues.

Second, in the course of the development of the record in relation to the purpose of, need for and alternatives to the GSX Canada Pipeline, the Panel may be asked to consider the environmental effects of the combustion of the gas to be transported. Those factors have already been included in the List of Issues to be considered during the hearing. A determination as to what the Panel will consider in conjunction with those factors has yet to be made.

Finally, the Panel notes that the Terms of Reference require it to consider the comments from the public received during the review. While the Panel is unable to actively consider some of those comments insofar as they relate to matters outside the scope of the review, the Panel does have the ability to reflect those comments in its report to the Minister, as it deems appropriate, and it intends to do so.

Directions as to the evidence to be filed in relation to the environmental effects of the combustion of the gas at the proposed new generation facility and the timing of its filing will be provided in conjunction with a letter setting out the revised schedule in relation to the hearing of this application.

The following issue has been added to the list of issues for the proposed GH-4-2001 hearing:

11. the environmental effects of the combustion of gas at the proposed new generation facility, being considered for Duke Point on Vancouver Island.

A revised List of Issues is attached.

Yours truly,

Michel L. Mantha
Secretary to the Joint Review Panel
GSX Canada Pipeline Project

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Revised List of Issues

The Joint Review Panel has identified, but does not limit itself to, the following issues for consideration in the hearing:

1. The economic feasibility of the proposed GSX Canada Pipeline having regard to, among other things:
   - the outlook for long-term demand for natural gas in the markets proposed to be served by the proposed pipeline;
   - the outlook for the long-term supply of natural gas available to be transported on the proposed pipeline;
   - the ability of the proposed GSX Canada Pipeline Project to attract volumes to its system over the long term; and
   - project financing with reference to the corporate structure of the Applicant and financial arrangements with related parties.

2. The potential environmental and socio-economic effects of the proposed GSX Canada Pipeline Project including those factors set out in subsections 16(1) and 16(2) of the *Canadian Environmental Assessment Act* as described below:
   - the environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
   - the significance of the effects referred to in the paragraph above;
   - comments from the public that are received during the review;
   - measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
   - the purpose of the Project;
   - alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means;
   - the need for, and the requirements of, any follow-up program in respect of the Project;
   - the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future;
   - need for the Project;
   - alternatives to the Project;
   - a description of the present environment which may reasonably be expected to be affected, directly or indirectly, by the Project, including adequate baseline characterization;
   - measures to enhance any beneficial environmental effects; and
   - proposal for contingency and emergency response plans.

3. The potential impact on landowners and communities affected by the selected route of the proposed pipeline, including:
   - The potential impact of the 30 metre safety zone; and
   - The potential impact on farming operations.

4. The appropriateness of the routing and location of the proposed facilities, land requirements and land rights acquisition process.

5. The safety of the design, construction, operation and emergency response planning for the proposed Project, including the potential for the occurrence of and consequences of failures, malfunctions or accidents.

6. The reasonableness of the proposed tolling methodology.

7. The terms and conditions to be included in any certificate which may be granted.

8. The adequacy of consultation with First Nations regarding the proposed Project.

9. The potential impact of the proposed Project on First Nation communities, traditional use activities, and their treaty and aboriginal interests.

10. The ability of the Applicant to manage risk and financial liabilities related to the construction, operation, and decommissioning of the proposed Project, and pipeline failures, malfunctions and accidents.

11. the environmental effects of the combustion of gas at the proposed new generation facility, being considered for Duke Point on Vancouver Island.

Note: Text appearing in bold indicates an addition to the List of Issues issued 31 January 2002.

File 3200-G49-1
18 October 2002

To All Parties to Hearing Order GH-4-2001

Hearing Order GH-4-2001 - Georgia Strait Crossing Pipeline Limited (GSX PL) - GSX Canada Pipeline Project

The Joint Review Panel (the Panel) received 15 motions asking the Panel to order GSX PL to answer outstanding information requests. In addition the Panel received 8 motions in relation to the setting of a date for the filing of intervenor evidence. On 26 September 2002, the Panel released its decisions in relation to these motions and advised at that time that reasons would be provided at a subsequent date. This letter sets out the Panel's reasons in relation to its decisions of 26 September 2002.

1.0 OUTSTANDING INFORMATION REQUESTS

By letter dated 27 June 2002, the Panel set a schedule for applications by intervenors to order the answers to over 100 questions contained in outstanding information requests (IRs). For reasons described in its correspondence of 12 July 2002, the Panel revised the schedule so that all motions were to be filed and served by 1 August 2002 and allowed all parties an opportunity to comment on all of the motions filed. The reply comments of the party filing the Notice of Motion were to be filed and served by 10 September 2002. This date was subsequently extended to accommodate parties who had not been served with the submissions of the Alberta Department of Energy. A list of the motions filed was provided in the Panel's correspondence of 26 September 2002 and will not be repeated here. As a result of this revised process, the Panel has had the benefit of the submissions of a number of parties on the issues to be determined by the Panel.

One of the primary issues of interest to the parties was the relevance of IRs related to the "purpose of", "need for" and "alternatives to" the proposed pipeline project. Another issue of interest was the relevance of questions related to the environmental effects of greenhouse gas emissions. These reasons provide the views of the Panel in relation to the relevance of IRs related to those issues. They also provide the views of the Panel on why no further response was required to other IRs.

Submissions of the Parties - "Alternatives to"

A number of parties argued that the Panel should require GSX PL to answer questions related to a broad range of alternatives to the proposed pipeline project, including "green" alternatives for the production of electricity such as solar, wind and tidal power. They submitted that these alternatives were relevant to the Panel's statutory mandate as the true purpose of the proposed pipeline project is to generate electricity. Others submitted that the relevance of this information should not be determined at this time but, rather, its relevance could be determined at a future date, once all the information is provided.

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Another submitter suggested that the relevance of the outstanding questions was not the issue but, rather, their materiality should be considered.

Some suggested that the purposes of the *Canadian Environmental Assessment Act* (CEA Act) require the broad consideration of a project, including its environmental repercussions and alternatives. Similarly, they argued, there is a duty on the Panel under the *National Energy Board Act* (NEB Act) not to exclude evidence that might be relevant to the public interest. It was also pointed out that, from an economic perspective, without the need for electricity generation the GSX proposal would have no credible economic rationale. Some noted that the public statements of BC Hydro and GSX PL have created a legitimate expectation among the public that the Joint Panel Review will include a consideration of Vancouver Island's electricity demand and the retirement of part of the existing subsea cable system. It was also submitted that considerations around the price of electricity were necessary in order to assess the pipeline proposal in relation to its alternatives. Others submitted that there was an obligation to avoid or reduce interference with aboriginal rights under s. 35 of the *Constitution Act* which requires a broad and careful consideration of alternatives.

While acknowledging provincial jurisdiction over electricity generation, parties argued that a federal body making a decision within a proper sphere of federal jurisdiction may take into consideration matters of provincial jurisdiction. A number of intervenors submitted that they were not asking the Panel to conduct a wholesale review of provincial energy policy but merely to take provincial matters into consideration. One intervenor noted that there must, however, be rational limits to the Panel's review. The issue is where the line should be drawn. That intervenor went on to comment that the Panel should not allow the corporate proponent to use the corporate structure it has created as a vehicle to artificially limit the scope of the Panel's review.

Another intervenor took a different perspective and stated that the real question was whether the intervenors have established that the proposed pipeline project is so completely integrated with the issue of the supply of electricity to Vancouver Island that it becomes relevant to the Panel's consideration. That intervenor submitted that the test had been met with the result that an examination of electricity demand and alternative means of meeting that demand have become relevant under both the CEA Act and the NEB Act. It was also submitted that the only practical reason why the Minister of Environment would have added "alternatives to the project" to the Terms of Reference as a factor for consideration would have been to ensure that the Panel would consider alternative methods of meeting electricity needs on Vancouver Island.

Some parties, particularly the provincial intervenors, argued for a limited jurisdiction in relation to a consideration of alternatives to the proposed pipeline project. It was submitted that even if the Panel did consider alternative ways of providing electricity to Vancouver Island, it would have no jurisdiction to implement its recommendations. As well, it was submitted that it was constitutionally inappropriate for the federal government to use a narrow ground of federal jurisdiction to conduct a far-ranging inquiry into matters that are exclusively within provincial jurisdiction. The consideration of alternatives, it was submitted, should be limited to other ways in which gas could be transported to Vancouver Island. To consider anything further would mean that there was no reasonable limit placed on what the responsible authority in any given case would have to consider.

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An intervenor suggested that the broad examination of alternatives would result in a re-scoping of th proposed pipeline project. It was submitted, with respect to environmental considerations, that the C Act defines the limitations on public interest under the NEB Act. GSX PL noted that receiving some the evidence suggested by the parties would expand the proceeding from a proceeding about a pipeli into a review of British Columbia energy strategy. Such a review, it suggested, would have no utility

Submissions of the Parties - Greenhouse Gas Emissions

Some parties asked far-ranging questions in relation to greenhouse gas (GHG) emissions. A number them submitted that these questions were necessary to adequately assess and consider those emission and their effects, including the effects on aboriginals and their rights. Some parties sought a national international measurement framework for GHG emissions.

Views of the Panel

The Panel has decided that it would be helpful to the parties to provide some guidance at this time in relation to the matters that it considers to be relevant to the applications under consideration. As a re these reasons will provide guidance in relation to the mandate of the Panel to consider alternatives to proposed pipeline project and the environmental effects of GHG emissions. In addition, the Panel w outline the other criteria it used when deciding whether it would direct GSX PL to respond to an outstanding information request.

Alternatives to the GSX Canada Pipeline Project

Parties relied on the NEB Act, the CEA Act and s. 35 of the *Constitution Act* as a basis for consideri wide variety of alternatives to the proposed pipeline project. Each of these statutory bases will be considered in turn, commencing with the NEB Act.

Section 52 of the National Energy Board Act

The Panel has considered its mandate under the NEB Act in order to determine what questions relate alternatives to the applied-for project should be answered as relevant to a consideration of GSX PL' application for a certificate of public convenience and necessity. Pursuant to s. 52 of the NEB Act, t Panel shall have regard to:

> all considerations that appear to it to be relevant, and may have regard to:
>
> - the existence of markets, actual or potential;
> - the economic feasibility of the pipeline;
> - the financial responsibility and financial structure of the application...;
> - and any public interest that in the [Panel's] opinion may be affected by the granting refusing of the application.

The determination to be made by the Panel is whether or not the pipeline is or will be required by the present and future public convenience and necessity. Any consideration under the NEB Act of the alternatives to the applied-for project would come within the ambit of s. 52.

The ability of the Panel to consider the environmental effects of the combustion of the gas to be transported by the proposed pipeline was argued by the Parties in April 2002. Notice of a constitutional question was served by the Province of British Columbia and both written and oral arguments were received. In its reasons set out in its 31 May 2002 letter, the Panel undertook an analysis of its constitutional authority to consider matters within provincial jurisdiction and found it had that ability pursuant to s. 52 as part of its consideration of both the benefits and the burdens that could result from a pipeline approval. As a result, the Panel found that it could consider the environmental effects of the emissions resulting from the combustion of the gas at the proposed electrical generation facility at Duke Point. It did not determine how much weight would be given to that evidence. The analysis found in those 31 May 2002 reasons is relevant to the issue before this Panel. The conclusion was that:

> [f]rom the case law it is clear that when determining whether a pipeline is in the public convenience and necessity the Panel must, *bona fide* and without a colourable purpose, decide what it sees as relevant to its determination. It may consider matters that are within provincial regulatory jurisdiction if it *bona fide* considers them to be relevant to its determination. So long as it avoids colourability, such as the "wholesale review" warned against in *Québec*,[1] taking provincial matters into consideration is likely constitutionally appropriate.

The Panel has considered the ramifications of undertaking an assessment of the alternatives to the proposed pipeline project that have been suggested by some of the parties. An analysis of the "green" energy alternatives, the development of demand side management, the development of coalbed methane on Vancouver Island, the development of hydro electric or other sources of electricity on the mainland, the refurbishment or replacement of part of the existing subsea cable system and the other alternatives unrelated to the transportation of gas that have been suggested through the course of this hearing process would all lead to this Panel undertaking an assessment of the energy strategy of the Province of British Columbia. It is this Panel's view that undertaking such a broad assessment and analysis under the NEB Act would be constitutionally inappropriate and would constitute the very thing warned against in the *Québec* case.

In the alternative, even if such a review were constitutionally appropriate, this Panel must consider whether or not such a review is relevant to its mandate under the NEB Act. What would the Panel do with this information? The decision that must be made by this Panel under the NEB Act is whether or not the GSX Canada Pipeline Project is in the public convenience and necessity. The Panel may, subject to Governor in Council approval, issue a s. 52 certificate with appropriate terms and conditions or refuse to issue a certificate. There is no requirement under the legislation for the Panel to undertake a wide-ranging examination of possible alternatives to a project that will use the gas to be transported by the applied-for pipeline project. Apart from denying the project, the Panel has no authority to make a decision with respect to any of the alternatives proposed.

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[1] *Québec (Attorney General)* v. *Canada (National Energy Board)*, [1994] 1 S.C.R. 159.

As the mandate of the National Energy Board (the Board) is to determine whether a project meets the public convenience and necessity test, the focus of the Board's examination has been on the benefits and burdens of an applied-for project, including its economic viability and robustness. Historically, in making such a determination, the Board has examined the need for a proposed project. In the course of considering the justification or need for a project, consideration has sometimes been given to alternatives related to the proposed pipeline project. This has involved, for example, a consideration of alternatives related to routing options and construction, engineering, operational and environmental techniques to mitigate impacts of the applied-for project.

The provision and use of energy is a part of virtually every new industrial proposal. However, this cannot mean that it would be appropriate for the regulator of the transportation system that will deliver the energy to regulate and control all proposed industrial development; such matters, the Panel notes, are usually subject to provincial and local control. By way of example, if the proposed pipeline project were an interprovincial gas pipeline that a proponent proposed to construct to bring gas to its plant that produces fertilizer for the local market, the Panel cannot direct the proponent to produce fertilizer at another location and ship it to the local market; or to reduce the local demand for fertilizer; or to develop and expand new technology for fertilizer production. This type of investigation would require the proponent to produce information on speculative projects that would not be relevant to the decision to be made by the Panel and are outside its mandate.

As the Panel noted in its letter of 31 May 2002, a consideration of the burdens and benefits of the applied-for project can include a consideration of relevant matters within provincial jurisdiction. That is very different from what some intervenors seek to include as relevant with their questions: the benefits and burdens of possible ways to reduce or meet the demand for electricity on Vancouver Island. There is a significant difference between the consideration of a specific matter clearly connected to the application before the Panel and an examination of speculative alternatives to the end use of the gas that would result in a review by this Panel of the energy strategy of the province. A consideration of new or different ways to generate or transport electricity to Vancouver Island, including coalbed methane; solar, wind, tidal or wave power; or the subsea cable system, is simply not relevant to the matters that must be considered by this Panel under the NEB Act and will not inform its decision. Furthermore, the time and effort required to undertake such a speculative exercise cannot be justified in light of this Panel's mandate. If this Panel should find that the proposed pipeline project is not in the public convenience and necessity, it remains to the Proponent to determine what, if anything, it will then do.

This does not mean that in the circumstances of this case the Panel will not carefully examine the economic feasibility of the proposed pipeline project. Historically the Board has assessed the economic feasibility of a gas pipeline facility by determining the likelihood of the facilities being used at a reasonable level over their economic life and the likelihood of the demand charges being paid. In looking at economic feasibility in general, the Board has been concerned with the question of who is at risk if a pipeline is not used and useful over its economic life. In many cases evidence that shipper contracts exist for some or most of the capacity on a proposed pipeline has been seen as evidence of economic feasibility.

In the case of the proposed pipeline project, however, the owner, shipper and one of its larger customers are inter-related. In this case the pipeline is 50% owned by BC Hydro, the sole shipper (Powerex) is 100% owned by BC Hydro and one of the generation facilities is 100% owned by BC Hydro.

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Furthermore, 100% of the electricity output of ICP is contracted to BC Hydro. In light of these inter-relationships and the fact that the generation facilities form the bulk of the demand for the gas proposed to be transported, the Panel has determined that a more wide-ranging inquiry into the economic justification for the proposed pipeline project is relevant to its ultimate determination under s. 52. Therefore, the Panel has decided to require a response to questions that seek to determine the continued viability of the generation facilities that will be the source of demand for most of the gas to be transported by the proposed pipeline project.

Canadian Environmental Assessment Act

The Panel turns next to the consideration of "alternatives to" under the CEA Act. The Agreement between the National Energy Board and the Minister of the Environment Concerning Review of the GSX Canada Pipeline Project Terms of Reference provide, in Part II, under "Factors to be Considered During Review", that the Panel consider the "purpose of" the project, the "need for" the project and the "alternatives to" the project. The latter two factors are not mandatory considerations under s. 16(1) of the CEA Act but can be included at the discretion of the Minister of the Environment after consultation with the responsible authorities.

In October 1998 the Canadian Environmental Assessment Agency released an Operational Policy Statement (OPS-EPO/2-1998) addressing the factors "need for", "purpose of", "alternatives to" and "alternative means" under the CEA Act. While the Panel recognizes that this is a policy document and is not binding upon it, it was referred to by a number of parties and the Panel found its guidance helpful. The Operational Policy Statement notes that the guidance is provided on the basis that environmental assessment is a decision-making planning tool rather than a project impact assessment tool. It states:

> The approach links considerations of "need for" the project, "purpose of" the project, "alternatives to" the project and "alternative means" of carrying out the project, in the early stages of project planning, and before irrevocable decisions on the project are made. In this way, the RA [Responsible Authority] and/or Proponent will be in a better position to define potential solutions to a problem, and to establish the viability of alternatives. **Importantly, their consideration will also help to establish the conditions under which certain effects may or may not be justified under the circumstances, should such a determination be subsequently required.** [emphasis added]

The Operational Policy Statement goes on to define the "need for" the project as the "problem or opportunity the project is intending to solve or satisfy." It establishes the "fundamental rationale for the project". The "purpose of" the project is defined as "what is to be achieved by carrying out the project". Both of these provide the context for the consideration of alternatives. "Alternatives to" the project are defined as "functionally different ways to meet the project need and achieve the project purpose".

Many parties argued that the "need for" and the "purpose of" the project were to address the demand for more electricity on Vancouver Island. Others took the view that the "need for" and "purpose of" were tied to the demand for more gas transportation to Vancouver Island. In light of the possible definitions of "need for" and "purpose of", the alternatives to be considered can range from other ways to meet the

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increased demand for electricity on Vancouver Island to other ways to transport gas to Vancouver Island.

The place to start, in the Panel's view, is with the project that is subject to assessment. The Panel considered and determined what constituted the "project" in its letter of 31 May 2002 at pages 13 to 16. The Panel has already made it clear that the project is the pipeline, a transportation undertaking that will move gas from one point to another, i.e. from an interconnection with the United States pipeline to an interconnection with the provincial pipeline. At page 18 the Panel stated:

> The scope of the project does not include the generation facilities nor any other facilities for the combustion of gas.

The gas transportation undertaking will primarily provide fuel for two electricity generating facilities: an existing generation facility at Campbell River (ICP) and a proposed generation facility at Duke Point. In addition the pipeline will meet the increasing demand for gas on Vancouver Island. In light of the project that is before this Panel for its consideration, an international gas transportation undertaking, the "need for" and "purpose of" that project relate to the increasing demand for gas on Vancouver Island, most of which demand comes from the aforementioned electrical generation facilities.

As noted in the Operational Policy Statement, the "need for" and "purpose of" provide the context for the determination of "alternatives to" the project. In most situations the "alternatives to" a transportation undertaking would be different routes or methods of transporting the commodity in question. For example, an alternative to the movement of a good by railway could be its transportation by a pipeline or by trucking on new or existing roadways. In the case of a gas pipeline, due to the nature of the commodity, alternatives to the transportation of gas by pipeline are somewhat circumscribed. Practically, alternatives considered typically entail different routes for the proposed pipeline project or, in some circumstances, the movement of liquified natural gas (LNG) or compressed natural gas (CNG) by other transportation options such as tanker, truck or railway car. GSX PL has provided information on the kinds of alternatives that are usually considered in relation to a transportation undertaking of this type.

The Panel has considered the submissions of a number of parties that, on the facts in this case, the consideration of "alternatives to" under the CEA Act should be expanded to include other ways of meeting or reducing the demand for electricity on Vancouver Island. These would include demand side management, "green" generation alternatives and methods to transmit electricity to Vancouver Island from the mainland.

In the Panel's view, it is useful to first consider the rationale for including in an environmental assessment a consideration of the alternatives to a proposed project. As the Panel has noted in the past, the CEA Act does not require it to select the best alternative to the applied-for project. Rather, the CEA Act requires a consideration of alternatives so that solutions to problems or obstacles can be discussed. The provision of information in relation to the different alternatives to the transportation of gas by the proposed pipeline project, for example other possible pipeline routes, should be sufficient to allow this to occur.

However, it is also important that the record reflect a consideration of alternatives to the applied-for project so that appropriate decisions can be made under s. 37 of the CEA Act. After this Panel

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completes the Joint Panel report, it will be sent to the Minister of the Environment and a response to the report will be prepared by the responsible authorities and must be approved by the Governor in Council. If it is found by this Panel that the project is likely to cause significant adverse environmental effects, consideration may need to be given to the question of whether those effects can be justified in the circumstances. A consideration of that issue could be included in the responsible authorities' response to the Joint Panel Report and would be subject to approval by the Governor in Council.[2] To ensure that this can occur, information in relation to the "purpose of", "need for" and "alternatives to" the project should be on the record and available for consideration.

Taking into consideration the limited purpose under the CEA Act for the examination of "alternatives to" and taking into account the "purpose of" and "need for" the proposed project, the Panel has determined that, in the particular and unique circumstances of this case, the consideration of "alternatives to" the project should not be limited to alternatives related to the transportation of gas to Vancouver Island. This will ensure that there is sufficient information available on the record to make the decision required under s. 37 if there is a likelihood of significant adverse environmental effects of the proposed pipeline project. The Panel notes that it is left to the responsible authorities and the Governor in Council to decide what, if any, use they will make of this information. The Panel is the body that can ensure that there is sufficient information available on the record to assist those who may need to determine if the project is "justified in the circumstances". On this basis what this Panel must decide is which of the many suggested "alternatives to" merit exploration.

It has been noted by the Panel in its letter of 31 May 2002 that there is an overall plan by BC Hydro, through various corporate relationships and partnerships with others, to construct and operate the proposed pipeline project, to purchase gas, and to transport and to use it to generate electricity which electricity it will then sell. At the same time it intends to retire a portion of the existing subsea cable system which provides electricity to Vancouver Island. This planned retirement is referred to in the materials filed by GSX PL as part of its application.[3] Questions have been asked by some parties about the possibility of refurbishing or replacing the portion of the existing cable system to be retired.

In light of the corporate interrelationships that link the applied-for project to the existing and proposed electricity generation facilities and the use by the Applicant of the planned retirement of a portion of the existing subsea cable system as a justification for the proposed project, and in order to ensure that sufficient information is on the record to enable decisions to be taken pursuant to s. 37 of the CEA Act, the Panel will consider the refurbishment or replacement of the existing subsea cable system as an alternative to the applied-for project. As a result, the Panel has decided that GSX PL will be required to answer information requests related to the consideration of the subsea cable system "alternative to" the applied-for project. However, in light of the limited purpose for which the "alternatives to" will be explored, the Panel will not examine the subsea cable system to the same degree as the applied-for project.

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[2]Pursuant to s. 5(2)(b)(ii) of the CEA Act the Board is not a responsible authority in this case for the purposes of s. 37.

[3]See GSX Project Communication Materials and Project Notifications, Volume III, Appendix B.

The other "alternatives to" suggested by parties for consideration, such as demand side management and wind, tidal, coal bed methane, solar or other developing technologies are not alternatives that can be usefully explored in light of the nature of the project before this Panel and its mandate. Furthermore, in light of the limited purpose for which "alternatives to" will be examined, the effort required to adequately explore these more speculative alternatives cannot be justified. It would entail, in essence, an exploration and examination of British Columbia energy policy. Such a review is not within the mandate of this Panel and, even for the limited purpose described here, may be constitutionally inappropriate. Furthermore, such an examination is, by indirect means, an expansion of the scope of the terms of reference, which terms were set by the Minister of Environment. The Minister set the scope of the project in the Terms of Reference and did not include the electrical generation facilities or the combustion of the gas to be transported.

The Constitution Act

The final basis argued for allowing questions tied to a broad consideration of "alternatives to" the applied-for project relates to s. 35 of the *Constitution Act*. The disallowed IRs posed by the Cowichan Tribes and the Sencot'en Alliance relate to purpose, need and alternatives to the project. With the exception of a refurbishment or replacement of the existing subsea cable system, the Panel has determined that alternatives that are unrelated to the transportation of gas are not relevant or are not within its mandate to consider. The parties to the consultations may find the decision of the Panel to be of assistance in setting the parameters of the consultation, but the Panel notes that the scope of consultations between the Crown and Aboriginal groups is a matter for those participants, not the Panel, to define. The participants may decide to discuss or resolve other matters in consultations but the Panel will only admit evidence that is relevant to the application before it. Evidence must therefore pertain to the applied-for project and mitigation or accommodation related to the project. Evidence that is not relevant to the matter before the Panel will not be admitted to the record.

Greenhouse Gas Emissions

A number of parties posed questions in relation to GHG emissions. Questions related to localized impacts as a result of climate change and global warming attributed to the project, GHG prevention possibilities from alternatives to the project, cumulative effects resulting from GHG emissions, and prices for GHG offsets. Some parties sought a broad-ranging examination of these matters and the potential effects. The Panel considers it helpful to provide some guidance on matters it considers relevant to this issue.

In its letter of 31 May 2002, the Panel determined that, under the NEB Act, it would consider the environmental effects of the combustion of the gas to be burned at the proposed Duke Point generation facility. As the burning of natural gas results in carbon dioxide, a GHG, consideration of the environmental effects of this emission should occur as part of the consideration of the environmental effects of the emissions from combustion. However, in the Panel's view, this does not realistically lead to a requirement that the project proponent undertake comparisons that would be of little use such as world-wide or continent-wide comparisons.

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In that GHG emissions are a global issue, many sources from around the world contribute to these emissions. To predict environmental change from a single project of this kind on a global scale and determine its significance, would be impractical and of little utility. However, the use of offsets or other mitigative measures to effectively reduce the overall GHG emissions from a project can be a more tangible method of mitigating or managing the effects of emissions once the offsets are realized. GSX PL is required to establish reasonable spatial and temporal boundaries for its environmental and cumulative effects assessment. It must consider cumulative effects, which can include a consideration of the effects of other projects if those effects act cumulatively with the effects from the emissions being considered by the Panel within those spatial and temporal boundaries. However, carrying out a project-specific cumulative effects assessment for GHG emissions would necessitate a consideration of all other existing and planned projects that produce global emissions. Considering the scale, cost, resources, timing, availability of data, and the questionable conclusiveness of global scale modeling, it is arguable whether any benefits could be realized by undertaking these types of assessments on a project-specific basis. Since global modeling is not feasible in this instance, the imposition of reasonable spatial and temporal boundaries can be used to provide a context for the consideration of GHG emissions from a point source.

A number of questions asked by intervenors went beyond what the Panel views as relevant to its mandate and exceeded what can reasonably be expected from the Proponent. The questions related to GHG emissions were examined with this framework in mind.

Summary

Under the CEA Act, the Panel has allowed questions relating to the refurbishment or replacement of the existing subsea cable system. This "alternative to" the applied-for project will be considered for the purpose of ensuring there is information on the record that could be used, if necessary, to ascertain under s. 37 of the CEA Act whether the project is justified in the circumstances. Alternatives that are not related to the transportation of gas, but to the transmission or generation of electricity, will not be considered under the NEB Act as such an examination is both constitutionally inappropriate and not relevant to the mandate of this Panel. Questions in relation to GHG emissions were allowed where they were found to be relevant to its consideration of emissions from the applied-for project and the proposed Duke Point electrical generation facility.

The Panel has provided the above guidance to parties in relation to "need for", "purpose of", and "alternatives to" the proposed pipeline project. It has also provided guidance on the scope of the assessment of the environmental effects of GHG emissions. It was within this framework that the Panel determined which IRs were relevant and should be answered by GSX PL. The Panel notes that a further response was not required to a number of IRs for other reasons. In some instances the question was unclear to the extent that a response could not reasonably be expected. In other instances the level of detail sought by an intervenor was so extensive as to be either irrelevant or unduly burdensome. In relation to some outstanding IRs, there was no apparent relevance of the information sought or its provision would require the expenditure of a degree of effort, money or time that could not be justified by its very marginal connection to the issues under consideration in this hearing. In other cases, GSX PL had adequately responded to the question posed or the question was so broad that it became irrelevant.

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2.0 FILING OF INTERVENOR EVIDENCE

The Panel received motions to delay the date for the filing of evidence from the Cowichan Tribes, the Sencot'en Alliance, the GSX Concerned Citizens Coalition (GSXCCC), Mairi McLennan, and Saturna Island Community Club (SICC). On 12 July 2002, the Panel stated that it would set a date in late September or early October 2002 for the filing of intervenor evidence unless it was persuaded by the arguments of parties that a later date is appropriate. The Panel also advised intervenors to continue to prepare their evidence.

The Cowichan Tribes and Sencot'en Alliance Motions

On 1 August 2002 the Panel received a motion from the Cowichan Tribes to adjourn the deadline for filing their intervenor evidence until aboriginal consultation has been satisfactorily concluded. The Cowichan Tribes submitted that substantial accommodation could, and very likely will, result in changes to the project and changes to the nature of the Cowichan Tribes' concerns. The Cowichan Tribes submitted that it cannot prepare its evidence until the Crown consultation process is complete, or has very substantially progressed, and that it cannot reasonably estimate the time it will take to properly prepare its written evidence. As such, the Cowichan Tribes argued that it is not appropriate or reasonable to reschedule the date for the filing of evidence but that, if a date must be set, it should not be until February 2003.

On 4 July 2002 the Sencot'en Alliance submitted a letter requesting that a date be set for the filing of their evidence only after the consultation process has been agreed to, consultations are well underway, and the parties have agreed to a realistic time frame in which consultation will be completed. The Panel, by way of a letter dated 12 July 2002, accepted the letter as a motion. On 1 August 2002 the Sencot'en Alliance filed a Supplemental Notice of Motion providing additional grounds in support of its motion. The Sencot'en Alliance submitted in the alternative that the Panel could set a date far enough in the future to allow consultations to be well underway and suggested the end of November 2002.

The GSX Concerned Citizens Coalition

On 9 July 2002, the Panel received a motion in letter format from GSXCCC to suspend the timetable for the review until its IRs were answered. This motion supplemented GSXCCC's 25 June 2002 letter to the Panel and was followed by GSXCCC's 1 August 2002 submissions. GSXCCC submitted that the information it sought is extensive and technical, and may be difficult to analyze. Further, GSXCCC submitted that the information sought is critical to the evidence it intends to file. GSXCCC proposed that, once aboriginal consultation is complete, the date for filing intervenors' evidence should be six weeks after answers to IRs are filed.

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Mairi McLennan

On 8 July 2002, the Panel received a motion from Mairi McLennan asking that the Panel defer the deadline for the filing of intervenors' evidence by at least two months plus any further time lost while the Panel addresses the motions concerning IRs. In her 1 August 2002 submissions, Ms. McLennan submits that the earliest deadline should be 15 November 2002, preferably the end of November, provided that aboriginal consultation is adequate and concerns specific to the Marine Coalition are resolved.

Saturna Island Community Club

By letter dated 26 June 2002, the Panel received a letter - which the Panel accepted as a motion - from SICC asking that the Panel postpone the submission of written evidence with respect to the marine environment until after the marine conference. SICC prefers that the marine conference take place in late October or in November, but does not indicate a specific date for the filing of written evidence concerning the marine environment.

GSX PL

By letter dated 29 August 2002, GSX PL replied to these motions, submitting that intervenors have had ample time to assess their interests and study their concerns. GSX PL noted that the application was filed in April 2001 and much other evidence was filed in the same year. Additional evidence and responses to IRs were filed in March and June, 2002, respectively. GSX PL is of the view that the duration and extent of the present record cannot give reasonable cause for further delay in the filing of intervenors' evidence on issues relevant to this proceeding. GSX PL submitted that the intervenors have not made persuasive arguments to cause the Panel to further delay the filing of intervenor evidence.

Views of the Panel

In the procedure established for this hearing, most of the evidence is filed in writing in advance of the hearing. However, it is important to note that pre-filed evidence does not necessarily constitute a party's final position on the application. Should circumstances change, intervenors have the ability to ask the Panel for leave to withdraw or amend their evidence. In the hearing, parties have the opportunity to cross-examine the Applicant, answer questions on their own evidence and raise concerns about the project or oppose it outright in final argument. All of the evidence, including pre-hearing filings and all of the evidence in the hearing itself, is considered by the Panel.

The Cowichan Tribes and Sencot'en Alliance can file their evidence based on their current positions in regard to the project. Parties to the consultations may decide that they wish to continue their discussions while the hearing is ongoing or even after the decision of the Panel has been rendered. If things change as a result of consultations, their evidence can be withdrawn or amended, with leave of the Panel. If the consultations result in changes to the project itself, it will be up to GSX PL to amend its application.

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In the Directions on Procedure, the date for the filing of intervenor evidence was initially set at 9 May 2002. The Panel issued a revised timetable on 31 May 2002 and, at that time, the date for the filing of evidence was set as 8 August 2002. On 12 July 2002, the Panel suspended the date for the filing of evidence in order to consider the motions regarding the date for the filing of evidence. The Panel has considered the submissions of the Parties and has decided that the deadline for the filing of intervenor evidence will be 28 November 2002. The Panel is of the view that the date set for the filing of the evidence allows sufficient time for these parties to prepare their evidence. The new schedule, which was attached to the Panel's 26 September 2002 letter, is attached to this letter.

Yours truly,

Michel L. Mantha
Secretary to the Joint Review Panel
GSX Canada Pipeline Project

Attachment

National Energy Board

Office national de l'énergie

File 3200-G49-1
20 January 2003

To All Parties to GH-4-2001:

Hearing Order GH-4-2001 - Georgia Strait Crossing Pipeline Limited (GSX PL) - GSX Canada Pipeline Project

The Joint Review Panel (the Panel) received 15 motions asking the Panel to order GSX PL to answer outstanding information requests. In addition the Panel received 8 motions in relation to the setting of a date for the filing of intervenor evidence. On 26 September 2002, the Panel released its decisions in relation to these motions and advised at that time that reasons would be provided at a subsequent date. On 18 October 2002 the Panel released its reasons in relation to its decision of 26 September 2002.

In mid-November 2002 the Panel received two Notices of Motion pursuant to s. 21 of the *National Energy Board Act* (NEB Act) seeking a review of the decision of 26 September 2002 and Part 1.0 of the reasons of 18 October 2002 (which are hereinafter referred to respectively as "the original decision" and "the original reasons"). By letter dated 13 January 2003 the Panel considered these motions and decided to review its original decision and reasons and vary its original reasons.[1] What follows is the original reasons as varied by the Panel. There was no application to vary Part 2.0 of the original reasons, the date for the filing of intervenor evidence. Part 2.0 of the original reasons has not be varied.

1.0 OUTSTANDING INFORMATION REQUESTS

By letter dated 27 June 2002, the Panel set a schedule for applications by intervenors to order GSX PL to answer over 100 questions contained in outstanding information requests (IRs). For reasons described in its correspondence of 12 July 2002, the Panel revised the schedule so that all motions were to be filed and served by 1 August 2002 and allowed all parties an opportunity to comment on all

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[1] The Panel is not varying the original decision which set out the IRs to be answered by GSX PL. Insofar as the cover letter that accompanied that determination referred to the Panel's reasoning, the reference in that letter to the Panel's determination on "alternatives to" can no longer stand as the Panel's reasoning has changed.

of the motions filed. The reply comments of the party filing the Notice of Motion were to be filed and served by 10 September 2002. This date was subsequently extended to 18 September 2002 to accommodate parties who had not been served with the submissions of the Alberta Department of Energy. A list of the motions filed was provided in the Panel's correspondence of 26 September 2002 and will not be repeated here. As a result of this revised process, the Panel has had the benefit of the submissions of a number of parties on the issues to be determined by the Panel.

One of the primary issues of interest to the parties was the relevance of IRs related to the "purpose of", "need for" and "alternatives to" the proposed pipeline project. Another issue of interest was the relevance of questions related to the environmental effects of greenhouse gas emissions. These reasons provide the views of the Panel regarding the answering of IRs related to those issues. They also provide the views of the Panel on why no further response was required to other IRs in issue.

Submissions of the Parties - "Alternatives to"

A number of parties argued that the Panel should require GSX PL to answer questions related to a broad range of alternatives to the proposed pipeline project, including "green" alternatives for the production of electricity such as solar, wind and tidal power. They submitted that these alternatives were relevant to the Panel's statutory mandate as the true purpose of the proposed pipeline project is to generate electricity. Others submitted that the relevance of this information should not be determined at this time but, rather, its relevance could be determined at a future date, once all the information is provided. Another submitter suggested that the relevance of the outstanding questions was not the issue but, rather, their materiality should be considered.

Some suggested that the purposes of the *Canadian Environmental Assessment Act* (CEA Act) require the broad consideration of a project, including its environmental repercussions and alternatives. Similarly, they argued, there is a duty on the Panel under the NEB Act not to exclude evidence that might be relevant to the public interest. It was also pointed out that, from an economic perspective, without the need for electricity generation the GSX proposal would have no credible economic rationale. Some noted that the public statements of BC Hydro and GSX PL have created a legitimate expectation among the public that the Joint Panel Review will include a consideration of Vancouver Island's electricity demand and the retirement of part of the existing subsea cable system. It was also submitted that considerations around the price of electricity were necessary in order to assess the pipeline proposal in relation to its alternatives. Others submitted that there was an obligation to avoid or reduce interference with aboriginal rights under s. 35 of the *Constitution Act* which requires a broad and careful consideration of alternatives.

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While acknowledging provincial jurisdiction over electricity generation, parties argued that a federal body making a decision within a proper sphere of federal jurisdiction may take into consideration matters of provincial jurisdiction. A number of intervenors submitted that they were not asking the Panel to conduct a wholesale review of provincial energy policy but merely to take provincial matters into consideration. One intervenor noted that there must, however, be rational limits to the Panel's review. The issue is where the line should be drawn. That intervenor went on to comment that the Panel should not allow the corporate proponent to use the corporate structure it has created as a vehicle to artificially limit the scope of the Panel's review.

Another intervenor took a different perspective and stated that the real question was whether the intervenors have established that the proposed pipeline project is so completely integrated with the issue of the supply of electricity to Vancouver Island that it becomes relevant to the Panel's consideration. That intervenor submitted that the test had been met with the result that an examination of electricity demand and alternative means of meeting that demand have become relevant under both the CEA Act and the NEB Act. It was also submitted that the only practical reason why the Minister of Environment would have added "alternatives to the project" to the Terms of Reference as a factor for consideration would have been to ensure that the Panel would consider alternative methods of meeting electricity needs on Vancouver Island.

Some parties, particularly the provincial intervenors, argued for a limited jurisdiction in relation to a consideration of alternatives to the proposed pipeline project. It was submitted that even if the Panel did consider alternative ways of providing electricity to Vancouver Island, it would have no jurisdiction to implement its recommendations. As well, it was submitted that it was constitutionally inappropriate for the federal government to use a narrow ground of federal jurisdiction to conduct a far-ranging inquiry into matters that are exclusively within provincial jurisdiction. The consideration of alternatives, it was submitted, should be limited to other ways in which gas could be transported to Vancouver Island. To consider anything further would mean that there was no reasonable limit placed on what the responsible authority in any given case would have to consider.

An intervenor suggested that the broad examination of alternatives would result in a re-scoping of the proposed pipeline project. It was submitted, with respect to environmental considerations, that the CEA Act defines the limitations on public interest under the NEB Act. GSX PL noted that receiving some of the evidence suggested by the parties would expand the proceeding from a proceeding about a pipeline into a review of British Columbia energy strategy. Such a review, it suggested, would have no utility.

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Submissions of the Parties - Greenhouse Gas Emissions

Some parties asked far-ranging questions in relation to greenhouse gas (GHG) emissions. A number of them submitted that these questions were necessary to adequately assess and consider those emissions and their effects, including the effects on aboriginals and their rights. Some parties sought a national or international measurement framework for GHG emissions.

Views of the Panel

The Panel has decided that it would be helpful to the parties to provide some guidance at this time in relation to the relevance of some of the matters that are the subject of outstanding information requests. In addition, the Panel will also outline the other criteria it used when deciding whether it would direct GSX PL to respond to an outstanding information request.

Alternatives to the GSX Canada Pipeline Project

Parties relied on the NEB Act, the CEA Act and s. 35 of the *Constitution Act* as a basis for considering a wide variety of alternatives to the proposed pipeline project. Each of these statutory bases will be considered in turn, commencing with the NEB Act.

Section 52 of the National Energy Board Act

The Panel has considered its mandate under the NEB Act in order to determine what questions related to alternatives to the applied-for project should be answered as relevant to a consideration of GSX PL's application for a certificate of public convenience and necessity. Pursuant to s. 52 of the NEB Act, the Panel shall have regard to:

> all considerations that appear to it to be relevant, and may have regard to:
>
> - the existence of markets, actual or potential;
> - the economic feasibility of the pipeline;
> - the financial responsibility and financial structure of the applicant...;
> - and any public interest that in the [Panel's] opinion may be affected by the granting or refusing of the application.

The determination to be made by the Panel is whether or not the pipeline is or will be required by the present and future public convenience and necessity. Any consideration under the NEB Act of the alternatives to the applied-for project would come within the ambit of s. 52.

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The ability of the Panel to consider the environmental effects of the combustion of the gas to be transported by the proposed pipeline was argued by the Parties in April 2002. Notice of a constitutional question as required by s. 57 of the *Federal Court Act* was served by the Province of British Columbia and both written and oral arguments were received. In this instance no constitutional notice was filed and served by the parties raising constitutional issues relating to the Panel's constitutional jurisdiction to consider some of the matters that were the subject of unanswered IRs. The Panel has determined that it can render a decision in relation to the outstanding IR's without considering the constitutional issues raised by the parties. In the result, the lack of actual constitutional notice does not prevent this Panel from determining the issues before it.

Most of the gas to be transported in the proposed pipeline will be used as fuel at two electrical generating facilities; one at Campbell River that is constructed and commissioned and a proposed facility at Duke Point. Intervenors have asked GSX PL IRs relating to other potential ways to meet the alleged need for electricity on Vancouver Island and about other potential sources of gas located on or near Vancouver Island. The Panel has been asked to determine if these IRs should be answered.

The Panel has considered the IRs which sought information on other potential ways to meet the alleged need for electricity on Vancouver Island such as the development of wind, wave or tidal power; the refurbishment or replacement of part of the existing subsea cable system and the development of demand side management. This Panel must consider whether or not such information is relevant to its consideration of the application before it pursuant to its mandate under the NEB Act.

As the mandate of the National Energy Board (the Board) is to determine whether a pipeline project meets the public convenience and necessity test, the focus of the Board's examination has been on the benefits and burdens of an applied-for project, including its economic viability and robustness. Historically, in making such a determination, the Board has examined the need for an applied-for project. In the course of considering the justification or need for a project, consideration has sometimes been given to alternatives related to the proposed pipeline project. This has involved, for example, a consideration of alternatives related to routing options and construction, engineering, operational and environmental techniques to mitigate impacts of the applied-for project. In this case, from the nature of the questions asked by some intervenors and from the letters and written and oral submissions the Panel has received over the course of this hearing process, it is evident that some intervenors and members of the public would like this Panel to compare or consider various ways to meet the alleged need for electricity on Vancouver Island other than the proposed generation facilities. The Panel must determine whether the consideration of these matters is relevant to its ultimate determination under s. 52. There are two ways in which such matters can be relevant. First, they can be relevant if they are matters that this Panel can regulate. Second, they can be relevant if they are matters that would inform the Panel's decision on the GSX Canada Pipeline Project under s. 52 of the NEB Act.

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The provision and use of energy is a part of virtually every new industrial proposal. However, this cannot mean that it is relevant for the regulator of the transportation system that will deliver the energy to examine, and then *de facto* control, all aspects of the proposed industrial development that will use the energy to be transported. By way of example, if the proposed pipeline project were an interprovincial gas pipeline that a proponent proposed to construct to bring gas to its plant that produces fertilizer for the local market, the Panel cannot direct the proponent to produce fertilizer at another location and ship it to the local market; or to reduce the local demand by farmers for fertilizer; or to develop and expand new technology for fertilizer production. This type of investigation would require the proponent to produce wide-ranging information on speculative projects over which the Board has no direct regulatory control. In short, if the purpose of requiring the requested information is to have this Panel exert regulatory control over possible projects outside the regulatory ambit of the Panel, the information is not relevant to the Panel's mandate.

The decision that must be made by this Panel under the NEB Act is whether or not the GSX Canada Pipeline Project is in the public convenience and necessity. The Panel may, subject to Governor in Council approval, issue a s. 52 certificate with appropriate terms and conditions or refuse to issue a certificate. Apart from denying the project before it, the Panel has no regulatory authority to make a decision with respect to any of the other sources of electricity proposed by the Parties.

The Panel agrees that it has a broad mandate under s. 52 of the NEB Act and is able to consider matters that it does not regulate. However, that mandate does not mean that the Panel can consider anything, for whatever it considers can ultimately form a part of its weighting of the factors to determine the public convenience and necessity. For it to take a matter into consideration, that matter must be connected to the application; there must be an appropriate proximity between it and the applied-for facilities. Without the requisite degree of connection or proximity, there is not the relevance necessary for inclusion of the matter in the Panel's considerations. Relevance is a question that must be determined on the facts of each case.

As the Panel noted in its letter of 31 May 2002, a consideration of the burdens and benefits of the applied-for project can include a consideration of the environmental effects of the burning of the gas at a plant with a close nexus or connection to the applied-for pipeline. That is very different from what some intervenors seek to include as relevant with their questions: the benefits and burdens of other possible ways to reduce or meet the alleged demand for electricity on Vancouver Island. There is a significant difference between the consideration of a specific matter clearly connected to the application before the Panel and an examination of potential alternatives to the ultimate product produced by the end use of the gas proposed to be transported. New ways to meet the alleged need for electricity on Vancouver Island, including demand side management and solar, wind, tidal or wave power simply do not have a sufficient connection or nexus to the application before this Panel and will not inform its

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decision. Furthermore, the time and effort required of the Proponent to undertake such an exercise cannot be justified. The relevance, utility and probative value of this information was not established by the intervenors. Therefore, the Panel will not require the Proponent to answer questions about these potential alternatives to the production of the electricity that would result from the burning of the gas proposed to be transported by the GSX Canada Pipeline Project. Furthermore, in light of this finding on relevance, the Panel will not consider evidence from intervenors on these matters.

The Panel finds the situation in relation to the replacement or refurbishment of the existing subsea cable system may be somewhat different. That cable system is presently operational and is providing electricity to Vancouver Island. Information in relation to the replacement or refurbishment of the existing subsea cable system as a possible way to meet the alleged need for electricity on Vancouver Island was referred to in the materials filed by GSX PL.[2] The company has answered the IRs on this system pursuant to the Panel's original decision and that information is now on the record. The Panel has decided that it will not determine at this time the relevance or weight of information in relation to this possible way to meet the alleged need for electricity on Vancouver Island. The Panel expects that it will hear argument on these issues at the oral hearing. The Panel reminds parties of the requirements of s. 57 of the *Federal Court Act* if they intend to raise constitutional arguments in relation to these issues.

While the Panel is not prepared to consider other ways to produce electricity on Vancouver Island as being relevant to its determination under s. 52, the Panel will examine the economic feasibility of the proposed pipeline project. Historically the Board has assessed the economic feasibility of a gas pipeline facility by determining the likelihood of the facilities being used at a reasonable level over their economic life and the likelihood of the demand charges being paid. In looking at economic feasibility in general, the Board has been concerned with the question of who is at risk if a pipeline is not used and useful over its economic life. In many cases evidence that shipper contracts exist for some or most of the capacity on a proposed pipeline has been seen as evidence of economic feasibility.

In the case of the proposed pipeline project, however, the owner, shipper and one of its larger customers are inter-related. In this case the pipeline is 50% owned by BC Hydro, the sole shipper (Powerex) is 100% owned by BC Hydro and one of the generation facilities is 100% owned by BC Hydro. Furthermore, 100% of the electricity output of Campbell River facilities is contracted to BC Hydro. In light of these inter-relationships and the fact that the generation facilities form the bulk of the demand for the gas proposed to be transported, the Panel has determined that a more wide-ranging inquiry into the economic justification for the proposed pipeline project is relevant to its ultimate determination under s. 52. Therefore, the Panel has decided to require a response to questions that seek to determine the long-term viability of the generation facilities that would be the source of demand for most of the gas to be transported by the proposed pipeline project.

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[2]See GSX Project Communication Materials and Project Notifications, Volume III, Appendix B.

Intervenors have also asked the Proponent questions about the potential development of coal bed methane and other potential local sources of gas. The Panel will not require the Proponent to answer these questions. The time, effort and expense involved in having the Proponent prepare information on these alleged alternate sources of gas supply cannot be justified. The Panel was not persuaded of the utility or probative value of requiring the Proponent to answer these questions. However, if any intervenors have evidence in relation to local sources of gas supply that they think should be considered when assessing whether the GSX Canada Pipeline Project is in the public convenience and necessity, they are not precluded from bringing that evidence before the Panel and demonstrating its relevance, veracity and weight.

Canadian Environmental Assessment Act

The Panel turns next to the consideration of "alternatives to" under the CEA Act. The Agreement Between the National Energy Board and the Minister of the Environment Concerning Review of the GSX Canada Pipeline Project Terms of Reference provides, in Part II, under "Factors to be Considered During Review", that the Panel consider the "purpose of" the project, the "need for" the project and the "alternatives to" the project. The latter two factors are not mandatory considerations under s. 16(1) of the CEA Act but can be included at the discretion of the Minister of the Environment after consultation with the responsible authorities.

In October 1998 the Canadian Environmental Assessment Agency released an Operational Policy Statement (OPS-EPO/2-1998) addressing the factors "need for", "purpose of", "alternatives to" and "alternative means" under the CEA Act. While the Panel recognizes that this is a policy document and is not binding upon it, it was referred to by a number of parties and the Panel found its guidance helpful. The Operational Policy Statement notes that the guidance is provided on the basis that environmental assessment is a decision-making planning tool rather than a project impact assessment tool. It states:

> The approach links considerations of "need for" the project, "purpose of" the project, "alternatives to" the project and "alternative means" of carrying out the project, in the early stages of project planning, and before irrevocable decisions on the project are made. In this way, the RA [Responsible Authority] and/or Proponent will be in a better position to define potential solutions to a problem, and to establish the viability of alternatives. Importantly, their consideration will also help to establish the conditions under which certain effects may or may not be justified under the circumstances, should such a determination be subsequently required.

The Operational Policy Statement goes on to define the "need for" the project as the "problem or opportunity the project is intending to solve or satisfy." It establishes the "fundamental rationale for the project". The "purpose of" the project is defined as "what is to be achieved by carrying out the project". Both of these provide the context for the consideration of alternatives. "Alternatives to" the project are defined as "functionally different ways to meet the project need and achieve the project purpose".

Many parties argued that the "need for" and the "purpose of" the project were to address the demand for more electricity on Vancouver Island. Others took the view that the "need for" and "purpose of" were tied to the demand for more gas transportation to Vancouver Island. In light of the possible definitions of "need for" and "purpose of", the alternatives to be considered can range from other ways to meet the increased demand for electricity on Vancouver Island to other ways to transport gas to Vancouver Island.

The place to start, in the Panel's view, is with the project that is subject to assessment. The Panel considered and determined what constituted the "project" in its letter of 31 May 2002 at pages 13 to 16. The Panel has already made it clear that the project is the pipeline, a transportation undertaking that would move gas from one point to another, i.e. from an interconnection with the United States pipeline to an interconnection with the provincial pipeline. At page 18 the Panel stated:

> The scope of the project does not include the generation facilities nor any other facilities for the combustion of gas.

The gas transportation undertaking would primarily provide fuel for two electricity generating facilities: an existing generation facility at Campbell River and a proposed generation facility at Duke Point. In addition the pipeline would meet the increasing demand for gas on Vancouver Island. In light of the project that is before this Panel for its consideration, an international gas transportation undertaking, the "need for" and "purpose of" that project relate to the alleged increasing demand for gas on Vancouver Island, most of which demand comes from the aforementioned electrical generation facilities.

As noted in the Operational Policy Statement, the "need for" and "purpose of" provide the context for the determination of "alternatives to" the project. In most situations the "alternatives to" a transportation undertaking would be different routes or methods of transporting the commodity in question. For example, an alternative to the movement of a good by railway could be its transportation by a pipeline or by trucking on new or existing roadways. In the case of a gas pipeline, due to the nature of the commodity, alternatives to the transportation of gas by pipeline are somewhat circumscribed. Practically, alternatives considered typically entail different routes for the proposed pipeline project or, in some circumstances, the movement of liquified natural gas (LNG) or compressed

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natural gas (CNG) by other transportation options such as tanker, truck or railway car. GSX PL has provided information on the kinds of alternatives that are usually considered in relation to a transportation undertaking of this type.

The Panel has considered the submissions of a number of parties that, on the facts in this case, the consideration of "alternatives to" under the CEA Act should be expanded to include other ways of meeting or reducing the demand for electricity on Vancouver Island. These would include demand side management, "green" generation alternatives and methods to transmit electricity to Vancouver Island from the mainland.

In the Panel's view, it is useful to first consider the rationale for including in an environmental assessment a consideration of the alternatives to a proposed project. As the Panel has noted in the past, the CEA Act does not require it to select the best alternative to the applied-for project. Rather, the CEA Act requires a consideration of alternatives so that solutions to problems or obstacles can be discussed. The provision of information in relation to the different alternatives to the transportation of gas by the proposed pipeline project, for example other possible pipeline routes, should be sufficient to allow this to occur.

The Panel notes that after it completes the Joint Panel report, it will be sent to the Minister of the Environment and a response to the report will be prepared by the responsible authorities and must be approved by the Governor in Council. If it is found by this Panel that the project is likely to cause significant adverse environmental effects, consideration may be given to the question of whether those effects can be justified in the circumstances pursuant to s. 37 of the CEA Act. A consideration of that issue could be included in the response to the Joint Panel Report and that response is subject to approval by the Governor in Council.[1] Information in relation to the "purpose of", "need for" and "alternatives to" the project can assist with this determination.

The Panel will not ask the Proponent to answer questions on the other potential ways suggested by parties to meet the alleged need for the generation of electricity on Vancouver Island such as demand side management and wind, tidal, solar power or other developing technologies. In the Panel's view, in light of the scope of the project subject to assessment, the Parties did not establish that these suggestions constituted "alternatives to" the project. Therefore, the Panel will not consider evidence from intervenors on these matters. Finally the Panel notes, such an examination could result by indirect means in an expansion of the scope of the terms of reference. The Minister of Environment set the scope of the project in the Terms of Reference and did not include the electrical generation facilities or the combustion of the gas to be transported.

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[1]This Panel and the National Energy Board do not prepare the response. As the application before the Panel is pursuant to s. 52 of the NEB Act which is on Schedule II of the Law List, pursuant to s. 5(2)(b)(ii) of the CEA Act, the Board is not a responsible authority in this case for the purposes of s. 37.

In relation to the replacement or refurbishment of the existing subsea cable system, as noted in the section of the reasons dealing with the NEB Act, the Panel has decided that it will not determine at this time the relevance or weight of that information. The Panel expects that it will hear arguments on those issues at the oral hearing.

Intervenors have also asked questions in relation to the possible development of local sources of gas, including coal bed methane. The Panel will not require the Proponent to answer these questions. The time, effort and expense involved in having the Proponent prepare information on these alleged alternate sources of gas supply cannot be justified. Its probative value and utility were not established by the Parties. However, as noted in the previous section of these reasons, if intervenors have evidence that there are local sources of gas supply that they view as alternatives to the proposed pipeline, they are not precluded from bringing that evidence before the Panel and demonstrating its relevance, veracity and weight.

Arguments of First Nations

The Panel is not persuaded by the arguments of the Cowichan Tribes and the Sencot'en Alliance that the duty of the Crown to consult pursuant to section 35 of the *Constitution Act* should affect the Panel's determination of whether to compel answers to outstanding information requests. The Panel will only admit evidence on the record if it may be relevant to the application before it. The parties to the consultations may find the decision of the Panel to be of assistance in setting the parameters of the consultation; however, the scope of consultations between the Crown and Aboriginal groups is a matter for those participants, not the Panel, to define. Consultations could conceivably involve discussion on issues that are of no relevance to the application before the Panel. The Panel will only compel the Applicant to respond to information requests if it is of the view that the information may be relevant to the consideration of the application before it.

Greenhouse Gas Emissions

A number of parties posed questions in relation to GHG emissions. Questions related to localized impacts as a result of climate change and global warming attributed to the project, GHG prevention possibilities from alternatives to the project, cumulative effects resulting from GHG emissions, and prices for GHG offsets. Some parties sought a broad-ranging examination of these matters and the potential effects.

In its letter of 31 May 2002, the Panel determined that, under the NEB Act, it would consider the environmental effects of the combustion of the gas to be burned at the proposed Duke Point generation facility. As the burning of natural gas results in carbon dioxide, a GHG, consideration of the

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environmental effects of this emission should occur as part of the consideration of the environmental effects of the emissions from combustion. However, in the Panel's view, this does not realistically lead to a requirement that the project proponent should be required to undertake world-wide or continent-wide comparisons.

In that GHG emissions are a global issue, many sources from around the world contribute to these emissions. The predictability and utility of requiring the Proponent to predict environmental change from a single project of this kind on a global scale and determine its significance, was not established by the intervenors. The probative value of such information was not adequately demonstrated. However, the use of offsets to effectively reduce the overall GHG emissions might be relevant to the consideration of the effects of emissions once the offsets are realized.

GSX PL is required to establish reasonable spatial and temporal boundaries for its environmental and cumulative effects assessment. It must consider cumulative effects, which can include a consideration of the effects of other projects if those effects act cumulatively with the effects from the emissions being considered by the Panel within those spatial and temporal boundaries. However, carrying out a project-specific cumulative effects assessment for GHG emissions would necessitate a consideration of all other existing and planned projects that produce global emissions of GHGs. Considering the scale, cost, resources, timing, availability of data, and the questionable conclusiveness of global scale modeling, it is arguable whether any benefits could be realized by undertaking these types of assessments on a project-specific basis. The Panel will not require the Proponent to answer questions of this type. The expense and effort required cannot be justified. The Proponent is expected to establish reasonable spatial and temporal boundaries to provide a context for the consideration of GHG emissions from a point source.

The relevance or utility of a number of the questions asked by intervenors was not established or the questions exceeded what can reasonably be required from the Proponent. The questions related to GHG emissions were examined with this framework in mind. However, the Panel wishes to make it clear that if Intervenors wish to file further information on the environmental effects of emissions from the proposed Duke Point facilities they are not precluded from doing so and demonstrating its relevance, veracity and weight.

Summary

Questions and evidence related to potentially different ways to meet the alleged need for electricity on Vancouver Island such as wind, solar and tidal power and demand side management will not be considered under the NEB Act or the CEA Act as such an examination is not relevant to the mandate of this Panel. Questions on the refurbishment or replacement of the existing subsea cable system have

already been answered by the project proponent. The Panel has not determined the relevance or weight to be given to this information and expects to hear argument at the oral hearing on the relevance and weight to be given under the NEB Act and the CEA Act to information on the subsea cable system.

The Proponent is not required to answer questions on potential local sources of gas such as coal-bed methane. However, intervenors are not precluded from filing this information in the hearing and demonstrating its relevance, veracity and weight. Questions in relation to GHG emissions have been allowed where they were found to be relevant to the Panel's consideration of emissions from the applied-for project and the proposed Duke Point electrical generation facility and not unduly burdensome. Similarly, intervenors are not precluded from filing information on GHG emissions and their environmental effects and demonstrating its relevance, veracity and weight.

The Panel has provided the above views in relation to "need for", "purpose of", and "alternatives to" the proposed pipeline project and the environmental effects of GHG emissions. It is within this framework that the Panel has determined which IRs are relevant and should be answered by GSX PL. The Panel notes that a further response is not required to a number of IRs for other reasons. In some instances the question was unclear to the extent that a response could not reasonably be expected. In other instances the level of detail sought by an intervenor was so extensive as to be either irrelevant or unduly burdensome. In relation to some outstanding IRs, there was no apparent relevance of the information sought or its provision would require the expenditure of a degree of effort, money or time that could not be justified by its very marginal connection to the issues under consideration in this hearing. The probative value of the information was not established by the intervenors. In other cases, GSX PL had adequately responded to the question posed or the question was so broad that it became irrelevant.

Yours truly,

Michel L. Mantha
Secretary to the Joint Review Panel
GSX Canada Pipeline Project

Appendix E

List of Intervenors

AMENDED LIST OF PARTIES / LISTE DES PARTIES MODIFIÉE

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GSX Canada Pipeline Project / Projet de pipeline GSX Canada

Hearing Order/Ordonnance d'audience GH-4-2001

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Appendix F

Abbreviations and Acronymns

ADoE	Alberta Department of Energy
ALR	Agricultural Land Reserve
the Agency	The Canadian Environmental Assessment Agency
the Agreement	Agreement between the National Energy Board and the Minister of the Environment
the Board or NEB	National Energy Board
BC	British Columbia
BC EAO	British Columbia Environmental Assessment Office
BC Hydro	British Columbia Hydro and Power Authority
BC MOF	British Columbia Ministry of Forests
BCUC	British Columbia Utilities Commission
BC WLAP	British Columbia Ministry of Water, Land and Air Protection
CDF Zone	Coastal Douglas Fir Zone
CEA Act	Canadian Environmental Assessment Act
Centra	Centra Gas British Columbia Inc.

Certificate	Certificate of Public Convenience and Necessity pursuant to section 52 of the NEB Act
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSA	Canadian Standards Association
CWH	Coastal Western Hemlock
DFO	Department of Fisheries and Oceans
EA	Environmental assessment
EAS	Environmental Alignment Sheets
EPN	Early Public Notification
EPP	Environmental Protection Program
EPR	Emergency Preparedness and Response Program
EPRPs	Environmental Protection and Reclamation Plans
ER	Ecological reserve
ER 67	Ecological Reserve 67
ESA	Environmentally Sensitive Area
FA	Federal Authority
FLR	Forest Land Reserve
GCFA	Gulf Crab Fishers Association
GHG	Greenhouse gases
GSX Canada LP	GSX Canada Limited Partnership
GSXCCC	Georgia Strait Crossing Concerned Citizens Coalition
GSX Project or Project	The Georgia Strait Crossing Canada Pipeline Project
GSX PL or the Applicant	Georgia Strait Crossing Pipeline Limited
ha	Hectare
HAZOP	Hazard and operability study
HDD	Horizontal directional drill
HRIA	Heritage Resource Impact Assessment
ICP	Campbell River cogeneration facility
IR	Information Request
Kyoto Protocol	Kyoto Protocol to the United Nations Framework Convention on Climate Change
m	metre

Minister	Minister of the Environment
Marine Coalition	Saturna Community Club, Pender Islands Conservancy Association, Salt Spring Island Conservancy, Canadian Parks and Wilderness Society, Georgia Strait Alliance and Saanich Inlet Protection Society
MMscf	Million standard cubic feet
MOG	Memorandum of Guidance
MT	Mega tonnes
NEB Act	National Energy Board Act
NMCA	National Marine Conservation Area
NPRI	National Pollutant Release Inventory
OPR	Onshore Pipeline Regulations, 1999
the Panel	Joint Review Panel
Province of BC	British Columbia Ministry of Energy and Mines
RA	Responsible Authority
ROV	Remotely operated vehicle
ROW	Right-of-way
SARA	Species at Risk Act
SEI	Sensitive Ecosystems Inventory
SMZ	Special Management Zone
SPEC/DSF	Society Promoting Environmental Conservation & David Suzuki Foundation
URED	Use, Recreation and Enjoyment of Public Reserve
US	United States
VCR Inc.	Voluntary Challenge & Registry Incorporated
VEC	Valued ecosystem component
VIEC	Vancouver Island Energy Corporation
VIGP	Vancouver Island Generation Project
VIPLA	Vancouver Island Pipeline Landowners Association
Williams	Williams Gas Pipeline Company

Appendix G

Public consultation by the Panel

To provide opportunity for public participation in the environmental assessment process the Panel undertook a number of activities to identify issues and concerns of those potentially affected by the project, to provide access to project information, to resolve some issues in the early stages to the Project, and to facilitate hearing participation.

Public Meetings

- Week of October 22, 2001. NEB and CEAA staff held public information sessions in Cobble Hill, Salt Spring Island, Sydney, Saturna Island and Pender Island. In addition, staff met with First Nation in Duncan and Sidney. The purpose of these sessions was to assist individuals to prepare for meaningful participation in the public hearing process for the GSX Canada Pipeline Project and to explain such matters as participant funding administered by the CEAA.
- From 11 January to 19 January 2002, the Panel held public consultation sessions and a workshop to hear comments from the public on which issues the Panel should consider during the hearing process and what further information should be obtained from GSX PL. The Panel also received written comments. The sessions were held in Vancouver, Sidney, Cobble Hill, Salt Spring Islands, Victoria, Saturna Island, and North Pender Island.
- On 14 and 15 November 2002 in Sidney, the panel held a pre-hearing conference on technical and scientific issues relating to the marine portion of the Project. The conference was designed for scientific and technical experts to explore selected marine issues in a facilitated, non-adversarial forum and make recommendations to the Panel aimed at narrowing scientific and technical differences.

Communications

- Invitation to public information and consultation sessions was advertised in local, and First Nations newspapers.
- In addition, over 350 stakeholders who participated in the scoping sessions held in June 2002 and stakeholders who wrote to the Board received by mail information related to the process, which included: the NEB - CEAA agreement, nomination of the Panel, Directions on Procedure, Public information notice announcing the public information and consultation sessions
- The Panel issued 13 procedural updates to inform the public on procedures relating to the hearing.
- The panel issued a document called "What Can I Expect at the Hearing?" that provided definitions and explanations on the hearing process in order to assist intervenors.
- The hearing was audio broadcast live from Sidney which allowed the public and the intervenors to follow the proceedings without having to travel and attend the hearing.

Applications and Evidence

Library

- The Panel requested that GSX PL make available for public viewing, at eleven locations, all documents relating to this application and public hearing process. GSX PL also provided CD ROM copies of large maps for more convenience.

Electronic copies of documents

- Electronic copies of documents issued by the Panel and intervenors, and letters of comment are available at the National Energy Board's Website (www.neb-one.gc.ca). Links to the electronic copies are also available at the Canadian Environmental Assessment Agency's Website (www.ceaa-acee.gc.ca). This is the first time that the Board's and the Agency's Websites have been employed this way. GSX PL documents are posted on GSX PL's Website.
- The Panel undertook to provide to other parties any documents submitted to the Panel before the start of the hearing on behalf of intervenors that requested it.

Appendix H

Acknowledgements

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